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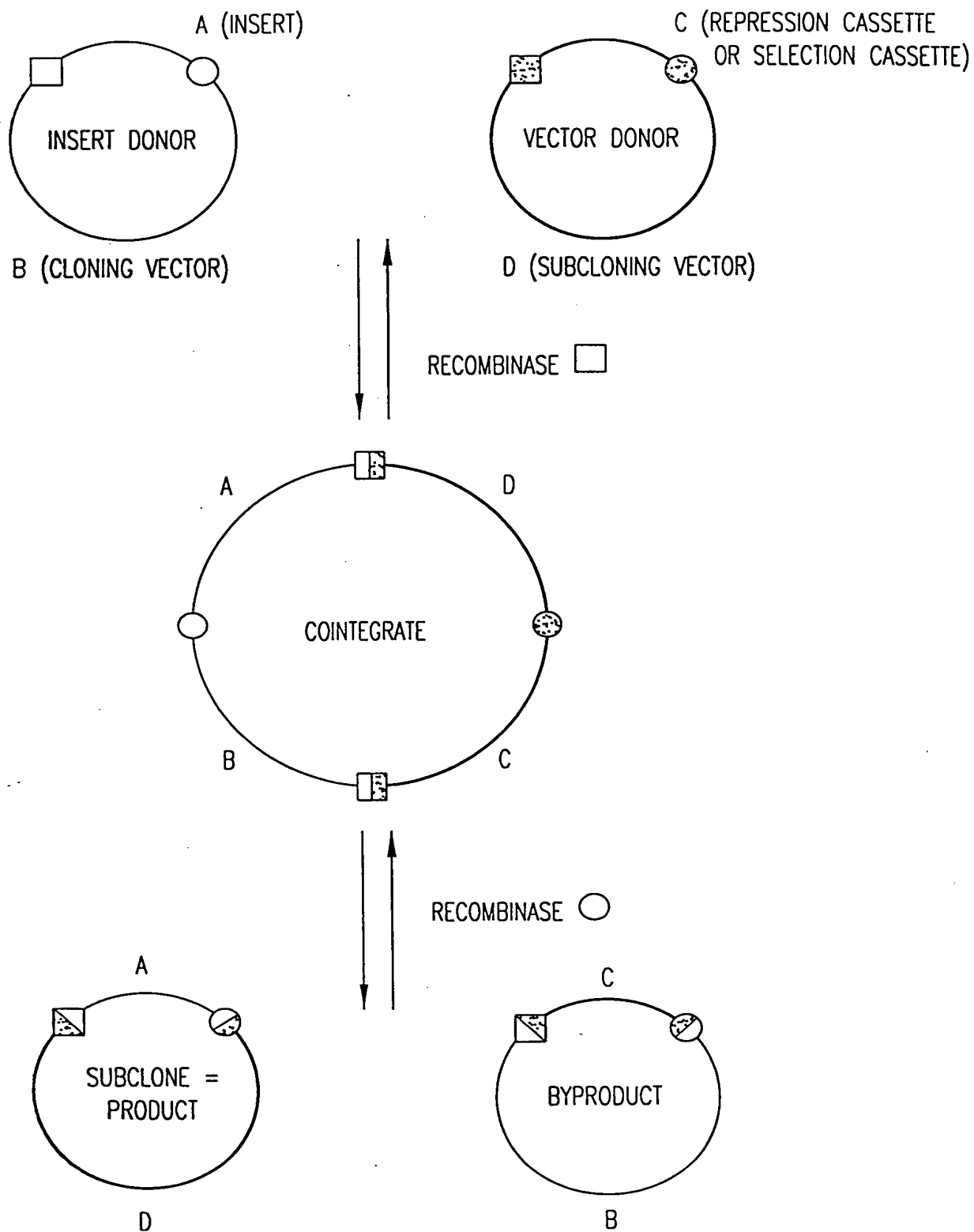


FIG.1

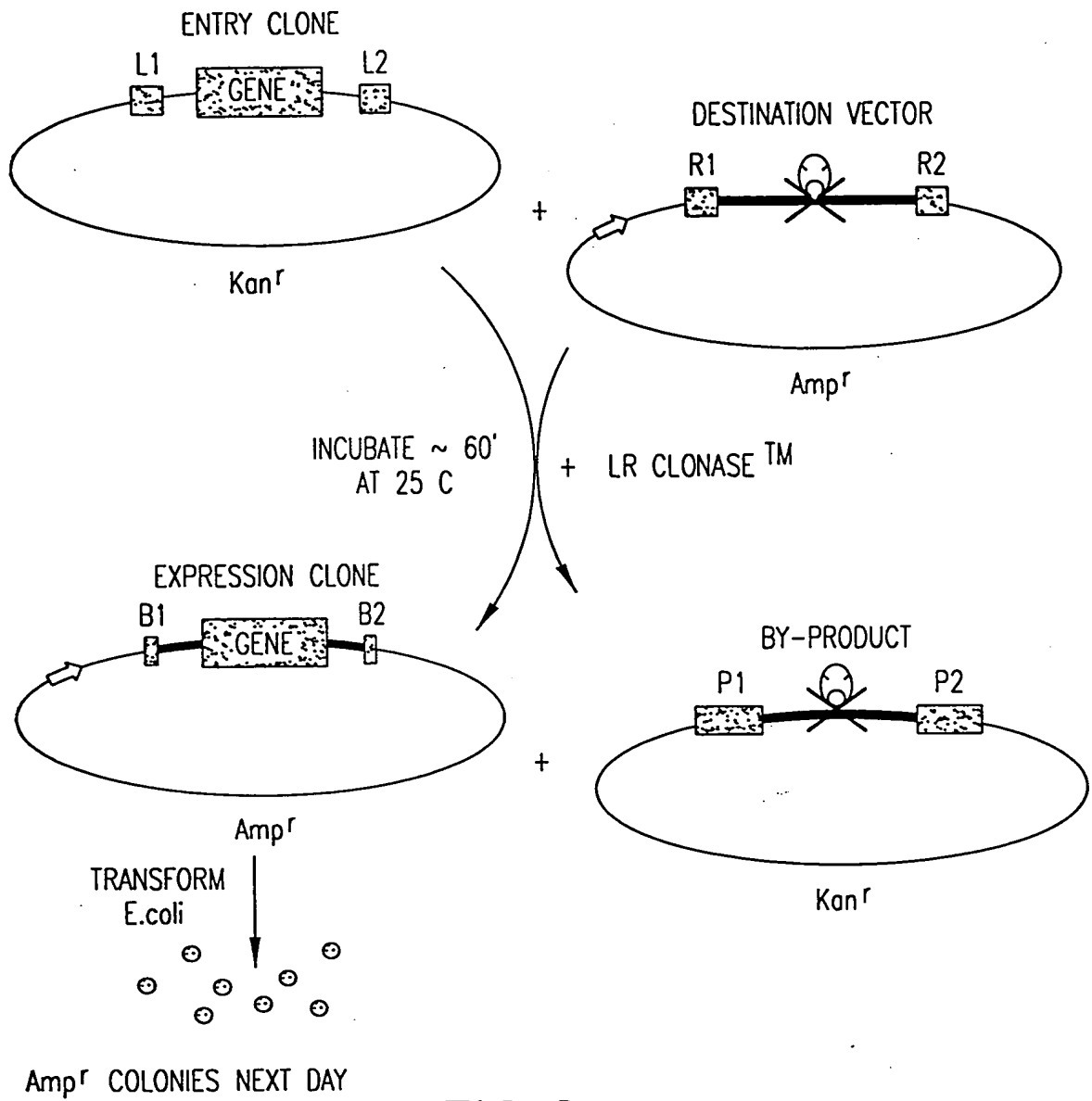


FIG.2

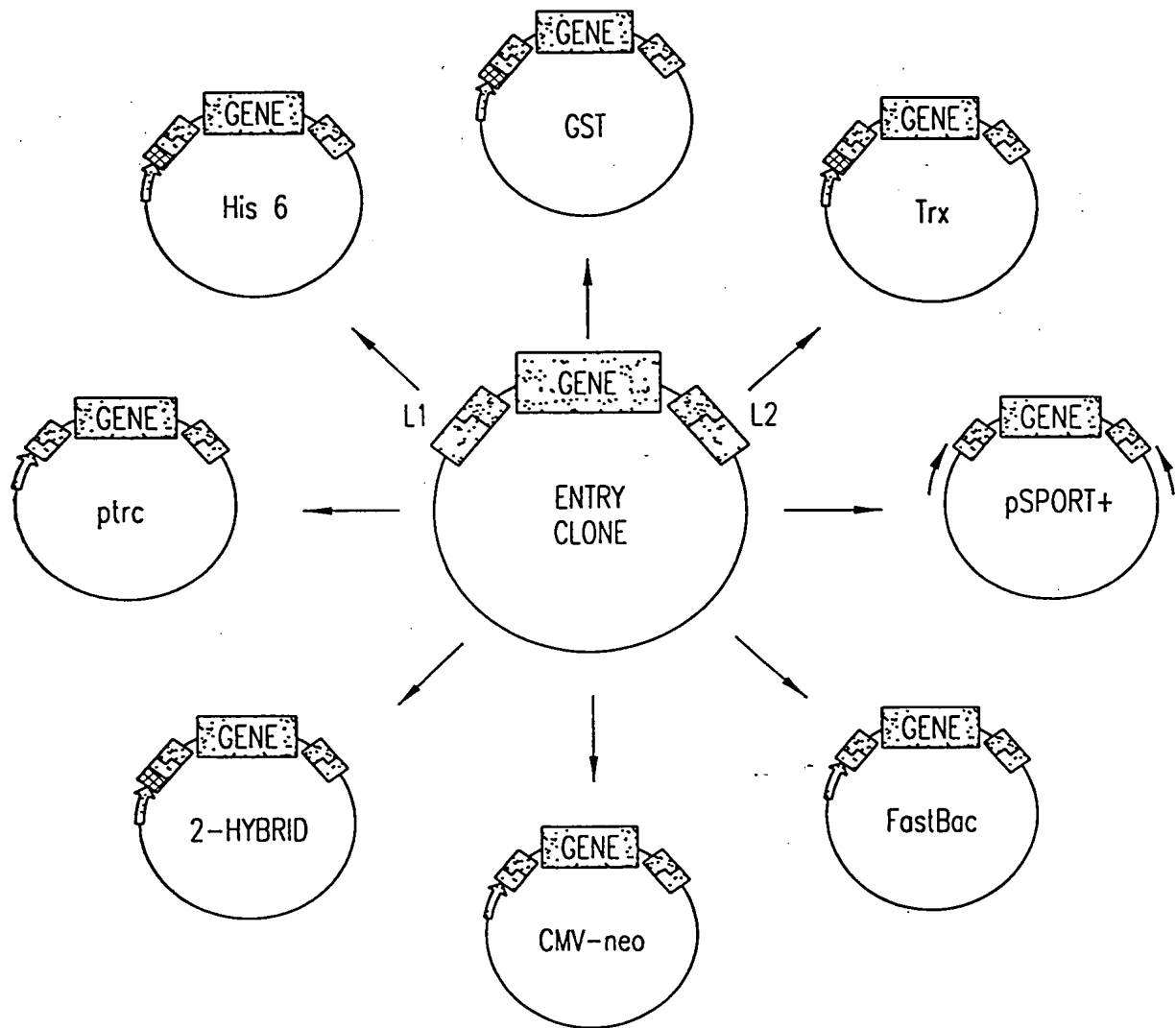


FIG.3

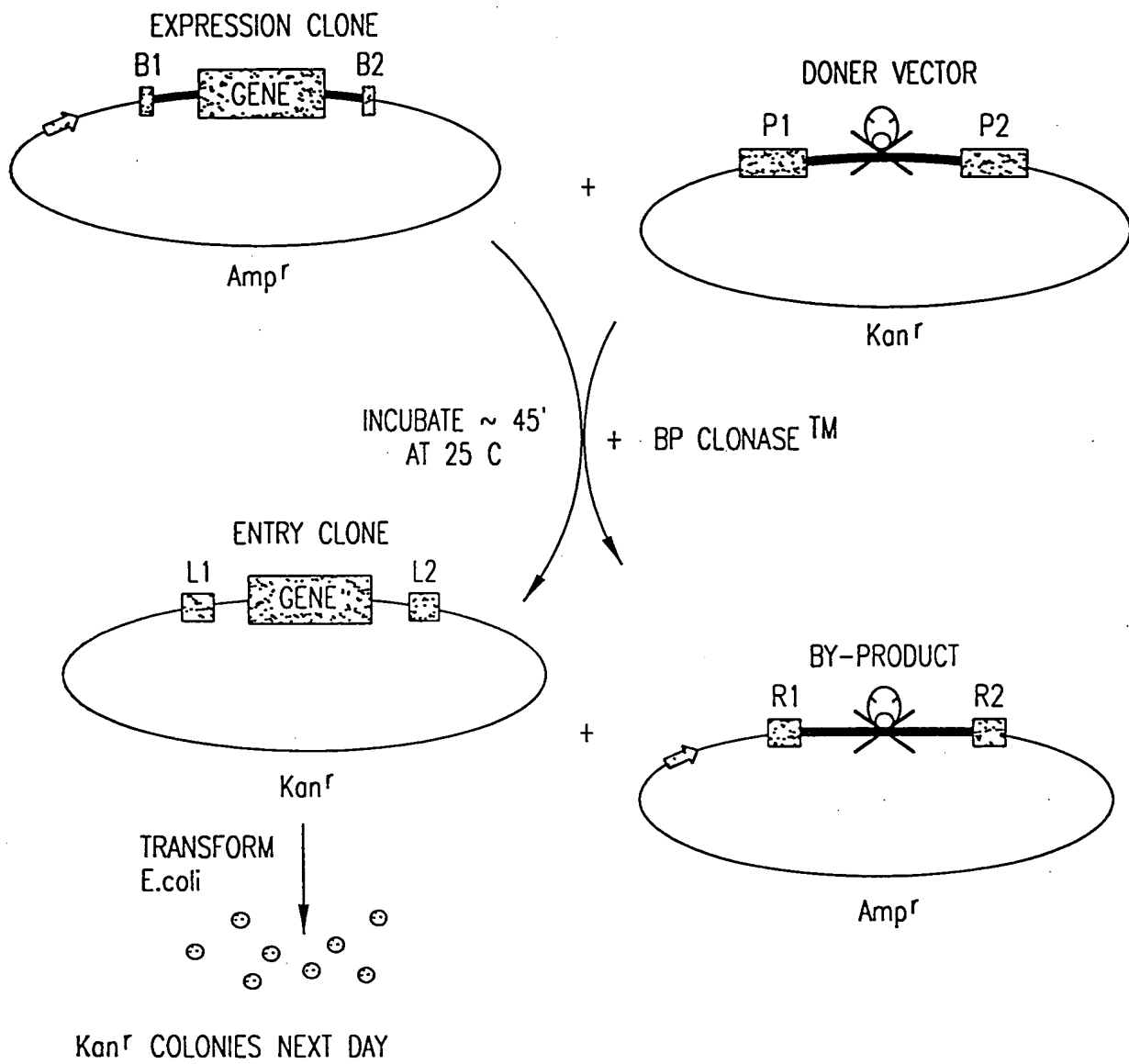


FIG.4

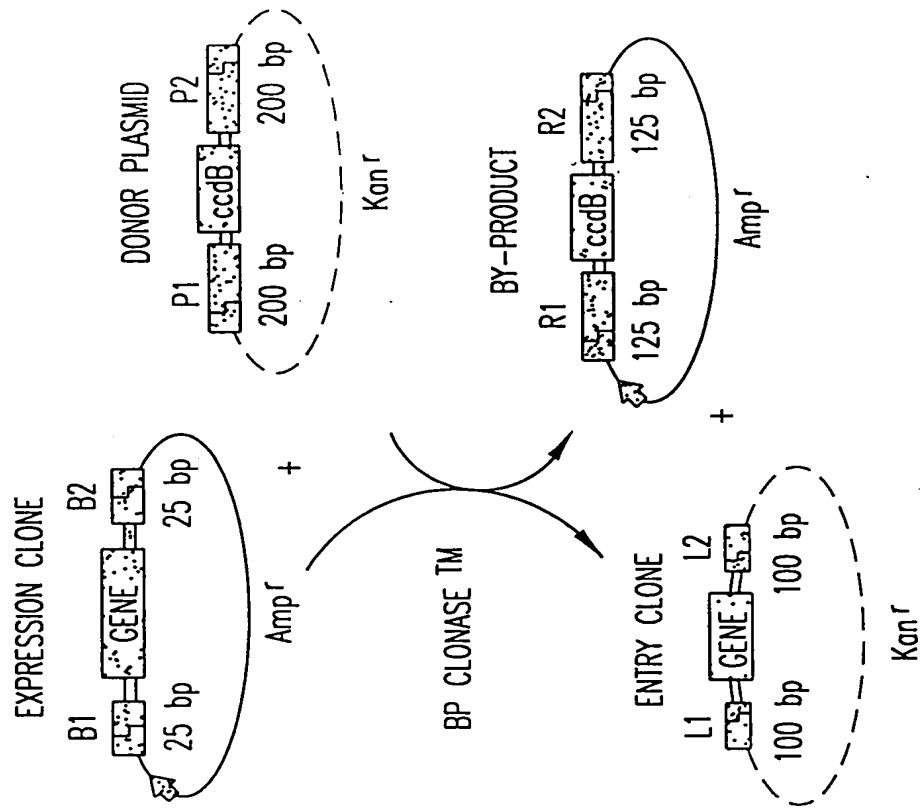


FIG. 5B

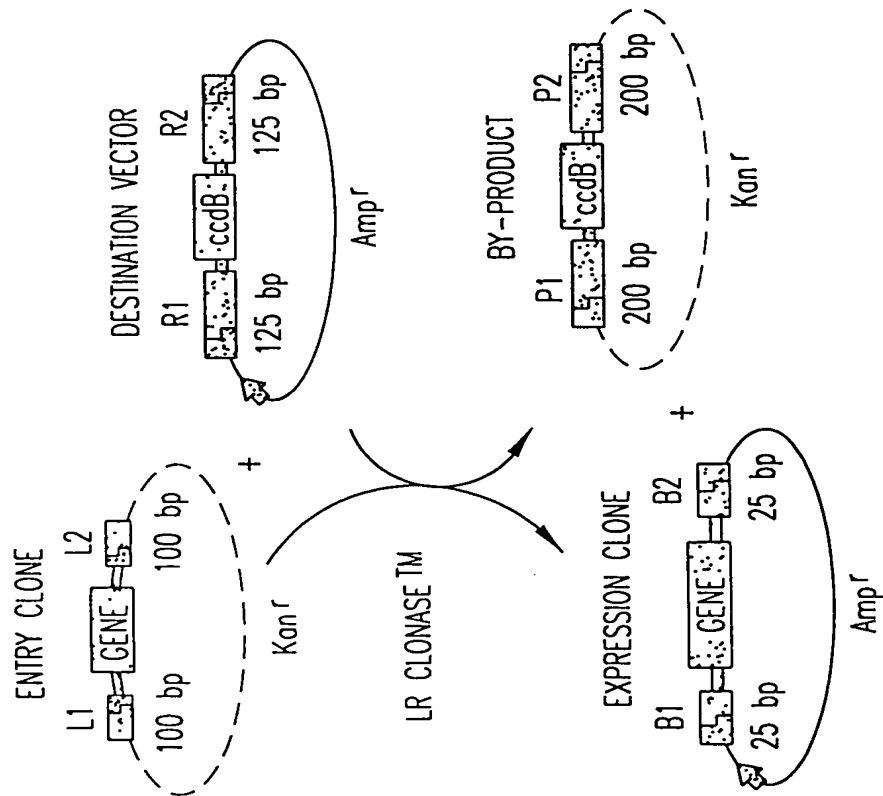


FIG. 5A

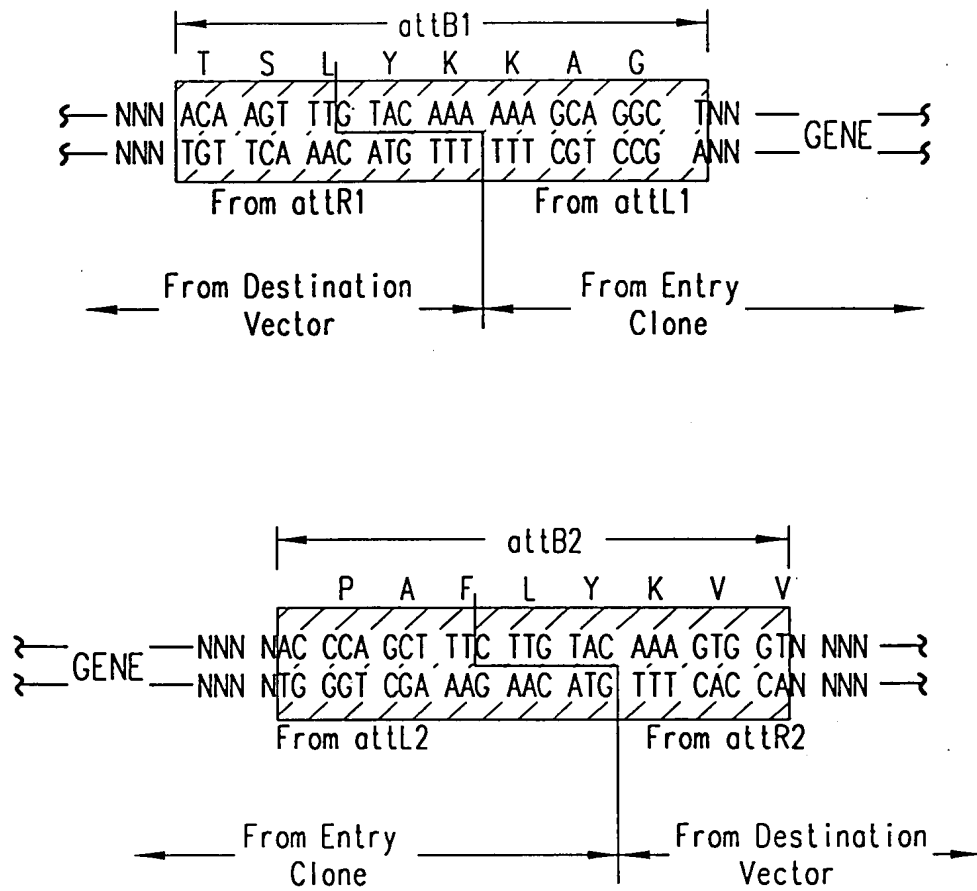


FIG.6

FOUR WAYS TO MAKE ENTRY CLONES

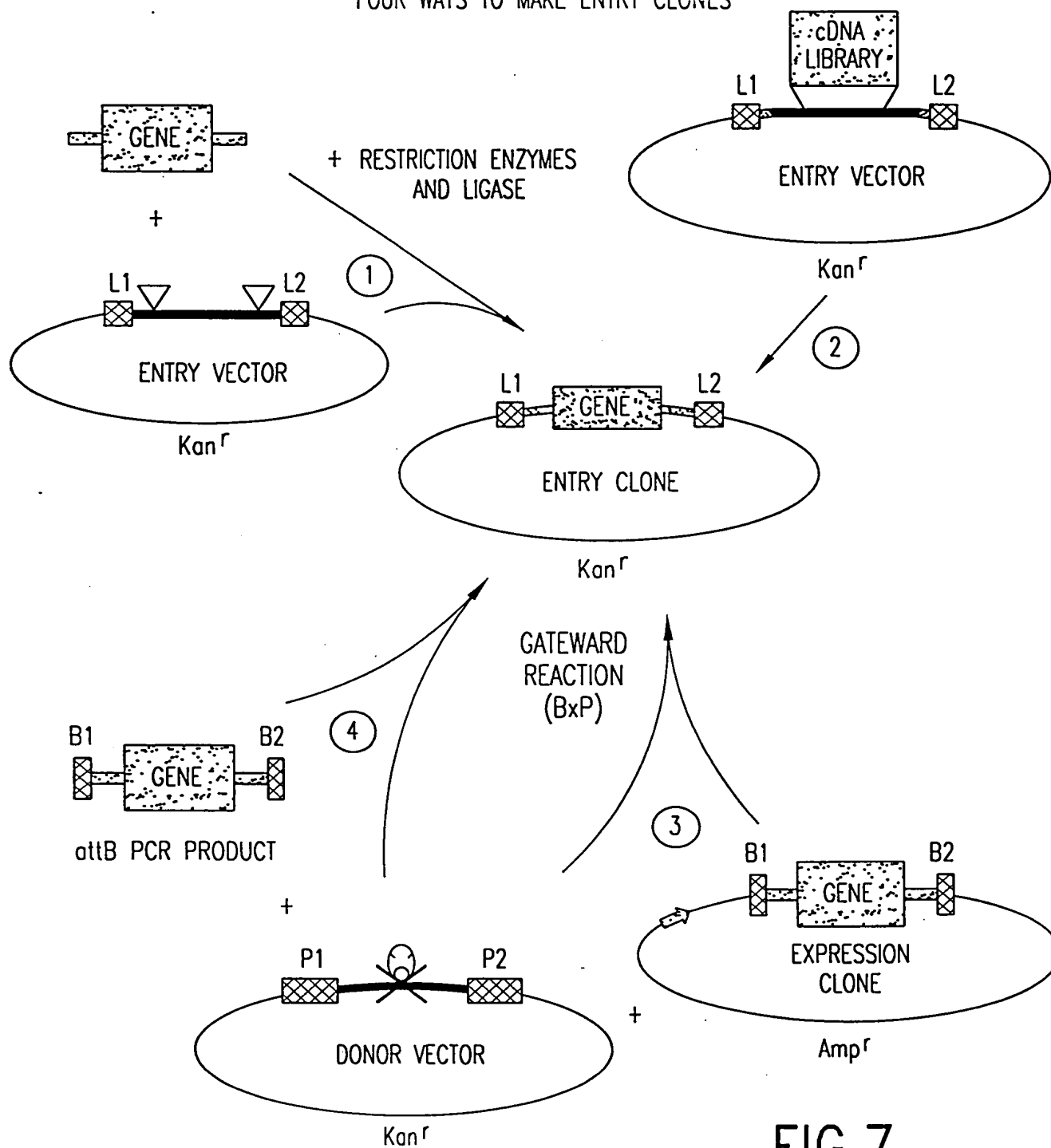


FIG.7

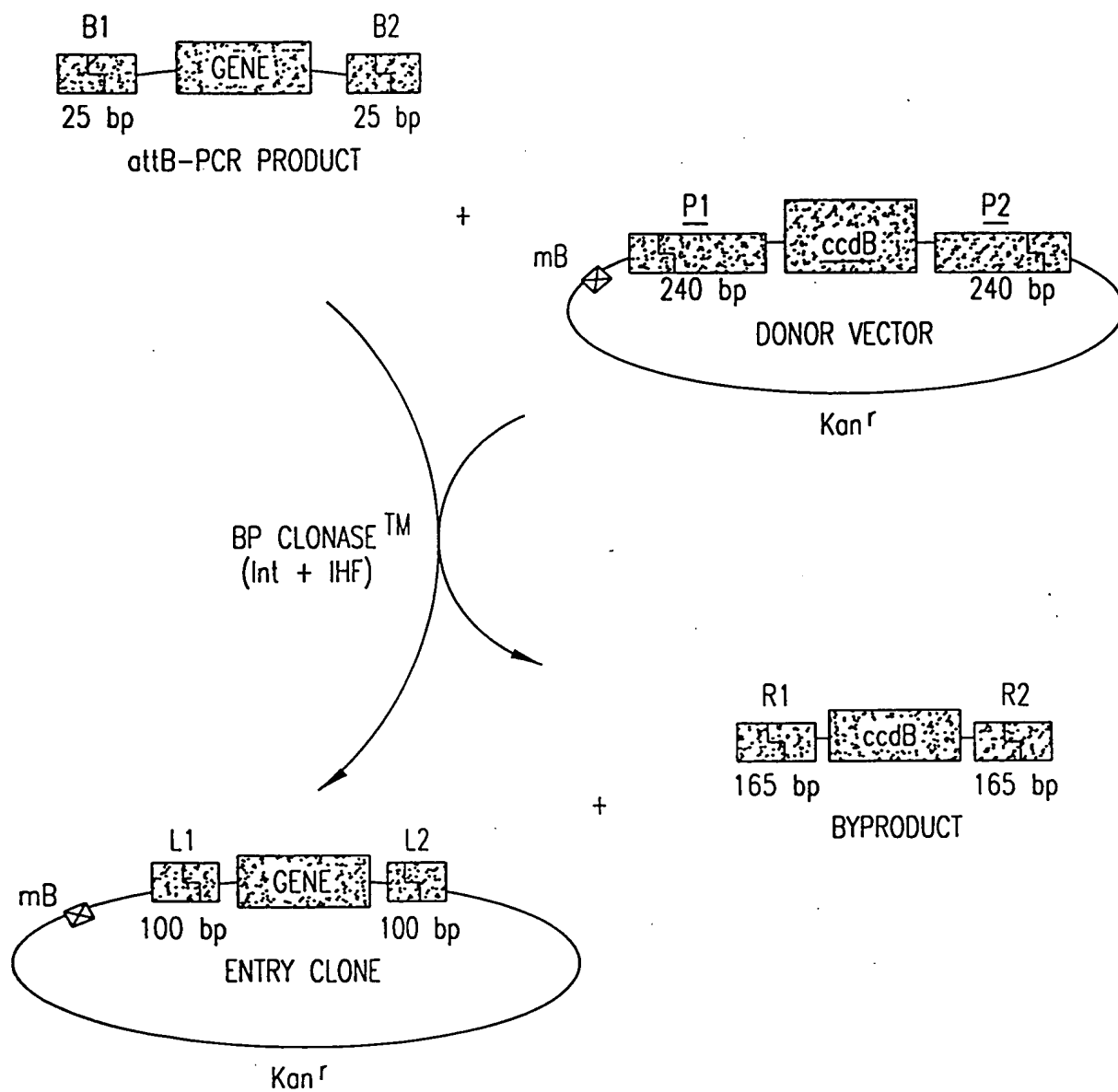


FIG.8

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Recombination Site Nucleotide Sequences

attB1: 5'-ACAAGTTTGTACAAAAAAGCAGGCT-3'

attB2: 5'-ACCCAGCTTTCTTGTACAAAGTGGT-3'

attP1: 5'-TACAGGTCACTAATACCATCTAAGTAGTTGATTCATAGTGACTGGATATG-
TTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTAATTTA-
ATATATTGATATTTATATCATTTTACGTTTCTCGTTCAGCTTTTTTGTAC-
AAAGTTGGCATTATAAAAAAGCATTGCTCATCAATTTGTTGCAACGAACA-
GGTCACTATCAGTCAAAATAAAATCATTATTTG-3'

attP2: 5'-CAAATAATGATTTTATTTTGACTGATAGTGACCTGTTTCGTTGCAACAAAT-
TGATAAGCAATGCTTTCTTATAATGCCAACTTTGTACAAGAAAGCTGAAC-
GAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCAT-
AAAAACAGACTACATAATACTGTAAACACAACATATCCAGTCACTATGA-
ATCAACTACTTAGATGGTATTAGTGACCTGTA-3'

attR1: 5'-ACAAGTTTGTACAAAAAAGCTGAACGAGAAACGTAAAATGATATAAA-
TATCAATATATTAAATTAGATTTTGCATAAAAAACAGACTACATAATAC-
TGTAACACACAACATATCCAGTCACTATG-3'

attR2: 5'-GCAGGTCGACCATAGTGACTGGATATGTTGTGTTTTACAGTATTAT-
GTAGTCTGTTTTTTATGCAAAATCTAATTTAATATATTGATATTT-
ATATCATTTTACGTTTCTCGTTCAGCTTTCTTGTACAAAGTGGT-3'

attL1: 5'-CAAATAATGATTTTATTTTGACTGATAGTGACCTGTTTCGTTGCAAC-
AAATTGATAAGCAATGCTTTTTTATAATGCCAACTTTGTACAAAAA-GCAGGCT-3'

attL2: 5'-CAAATAATGATTTTATTTTGACTGATAGTGACCTGTTTCGTTGCAACAA-
ATTGATAAGCAATGCTTTCTTATAATGCCAACTTTGTACAAGAAAGCTGGGT-3'

FIG.9

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Cloning sites of the Entry Vector pENTRTM 1A
(reading frame A)

							<i>Dra</i> I					<i>Xmn</i> I					<i>Sal</i> I					<i>Bam</i> H I			<i>Kpn</i> I			<i>Eco</i> R I
ACT	TTG	TAC	AAA	AAA	GCA	GGC	TTT	AAA	GGA	ACC	AAT	TCA	GTC	GAC	TGG	ATC	CGG	TAC	CGA	ATT	C							
TGA	AAC	ATG	TTT	TTT	CGT	CCG	AAA	TTT	CCT	TGG	TTA	AGT	CAG	CTG	ACC	TAG	GCC	ATG	GCT	TAA	G							
thr	leu	tyr	lys	lys	ala	gly	phe	lys	gly	thr	asn	ser	val	asp	trp	ile	arg	tyr	arg	ile								

							<i>Eco</i> R I		<i>Not</i> I			<i>Xho</i> I		<i>Eco</i> R V				
[ccdB gene]		G	AAT	TCG	CGG	CCG	CAC	TCG	AGA	TAT	CTA	GAC	CCA	GCT	TTC	TTG	TAC	AAA
		C	TTA	AGC	GCC	GGC	GTG	AGC	TCT	ATA	GAT	CTG	GGT	CGA	AAG	AAC	ATG	TTT

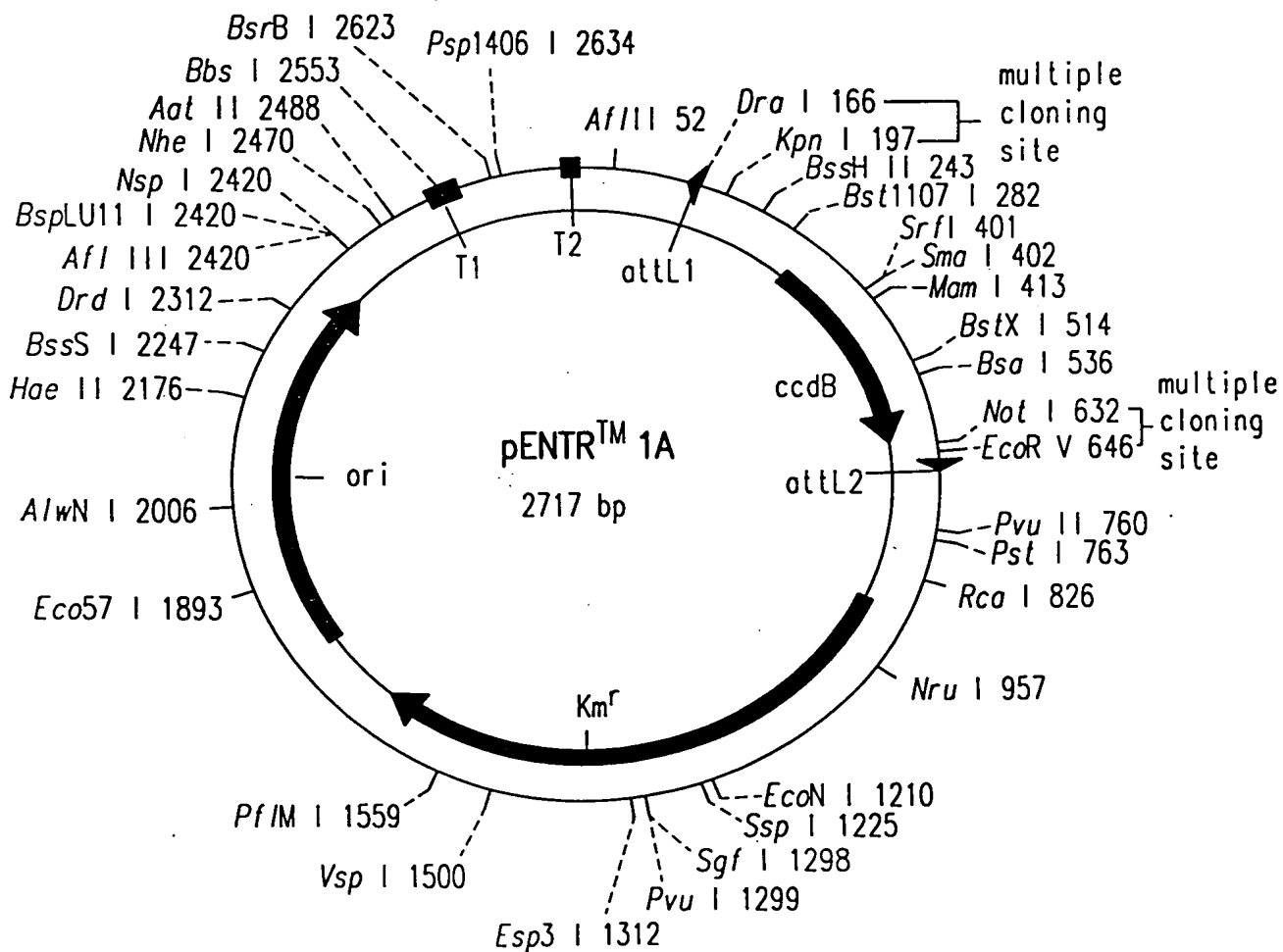


FIG.10A

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pENTR1A 2717 bp

Base Nos.	Gene Encoded
67..166	attL1
321..626	ccdB
655..754	attL2
877..1686	KmR
1791..2364	ori

1	CTGACGGATG	GCCTTTTTGC	GTTTCTACAA	ACTCTTCCTG	TTAGTTAGTT	ACTTAAGCTC
61	GGGCCCCAAA	TAATGATTTT	ATTTTGACTG	ATAGTGACCT	GTTTCGTTGCA	ACAAATTGAT
121	AAGCAATGCT	TTTTTATAAT	GCCAACTTTG	TACAAAAAAG	CAGGCTTTAA	AGGAACCAAT
181	TCAGTCGACT	GGATCCGGTA	CCGAATTCGC	TTACTAAAAG	CCAGATAACA	GTATGCGTAT
241	TTGCGCGCTG	ATTTTTGCGG	TATAAGAATA	TATACTGATA	TGTATACCCG	AAGTATGTCA
301	AAAAGAGGTG	TGCTTCTAGA	ATGCAGTTTA	AGGTTTACAC	CTATAAAAGA	GAGAGCCGTT
361	ATCGTCTGTT	TGTGGATGTA	CAGAGTGATA	TTATTGACAC	GCCCGGGCGA	CGGATAGTGA
421	TCCCCTGGC	CAGTGCACGT	CTGCTGTCAG	ATAAAGTCTC	CCGTGAACTT	TACCCGGTGG
481	TGCATATCGG	GGATGAAAGC	TGGCGCATGA	TGACCACCGA	TATGGCCAGT	GTGCCGGTCT
541	CCGTTATCGG	GGAAGAAGTG	GCTGATCTCA	GCCACCGCGA	AAATGACATC	AAAAACGCCA
601	TTAACCTGAT	GTTCTGGGGA	ATATAGAATT	CGCGGCCGCA	CTCGAGATAT	CTAGACCCAG
661	CTTTCTTGTA	CAAAGTTGGC	ATTATAAGAA	AGCATTGCTT	ATCAATTTGT	TGCAACGAAC
721	AGGTCACTAT	CAGTCAAAAT	AAAATCATT	TTTGCCATCC	AGCTGCAGCT	CTGGCCCGTG
781	TCTCAAAATC	TCTGATGTTA	CATTGCACAA	GATAAAAATA	TATCATCATG	AACAATAAAA
841	CTGTCTGCTT	ACATAAACAG	TAATACAAGG	GGTGTTATGA	GCCATATTCA	ACGGGAAACG
901	TCGAGGCCGC	GATTAAATTC	CAACATGGAT	GCTGATTTAT	ATGGGTATAA	ATGGGCTCGC
961	GATAATGTCTG	GGCAATCAGG	TGCGACAATC	TATCGCTTGT	ATGGGAAGCC	CGATGCGCCA
1021	GAGTTGTTTC	TGAAACATGG	CAAAGGTAGC	GTTGCCAATG	ATGTTACAGA	TGAGATGGTC
1081	AGACTAAACT	GGCTGACGGA	ATTTATGCCT	CTTCCGACCA	TCAAGCATT	TATCCGTACT
1141	CCTGATGATG	CATGGTTACT	CACCACTGCG	ATCCCCGGAA	AAACAGCATT	CCAGGTATTA
1201	GAAGAATATC	CTGATTACAG	TGAAAATATT	GTTGATGCGC	TGGCAGTGTC	CCTGCGCCGG
1261	TTGCATTCTGA	TTCTGTTTG	TAATTGTCTT	TTTAAACAGC	ATCGCGTATT	TCGTCTCGCT
1321	CAGGCGCAAT	CACGAATGAA	TAACGGTTTG	GTTGATGCGA	GTGATTTTGA	TGACGAGCGT
1381	AATGGCTGGC	CTGTTGAACA	AGTCTGGAAA	GAAATGCATA	AACTTTTGCC	ATTCTCACCG
1441	GATTCAGTCG	TCACTCATGG	TGATTTCTCA	CTTGATAACC	TTATTTTGA	CGAGGGGAAA
1501	TTAATAGGTT	GTATTGATGT	TGGACGAGTC	GGAATCGCAG	ACCGATACCA	GGATCTTGCC
1561	ATCCTATGGA	ACTGCCTCGG	TGAGTTTTCT	CCTTCATTAC	AGAAACGGCT	TTTTCAAAAA
1621	TATGGTATTG	ATAATCCTGA	TATGAATAAA	TTGCAGTTTC	ATTTGATGCT	CGATGAGTTT
1681	TTCTAATCAG	AATTGGTTAA	TTGGTTGTAA	CATTATTCAG	ATTGGGCCCC	GTTCCACTGA
1741	GCGTCAGACC	CCGTAGAAAA	GATCAAAGGA	TCTTCTTGAG	ATCCTTTTTT	TCTGCGCGTA
1801	ATCTGCTGCT	TGCAAACAAA	AAAACCACCG	CTACCAGCGG	TGGTTTGTTT	GCCGGATCAA
1861	GAGCTACCAA	CTCTTTTTCC	GAAGGTAAC	GGCTTCAGCA	GAGCGCAGAT	ACCAAATACT
1921	GTTCTTCTAG	TGTAGCCGTA	GTTAGGCCAC	CACTTCAAGA	ACTCTGTAGC	ACCGCCTACA
1981	TACCTCGCTC	TGCTAATCCT	GTTACCAAGT	GCTGCTGCCA	GTGGCGATAA	GTCGTGTCTT
2041	ACCGGGTTGG	ACTCAAGACG	ATAGTTACCG	GATAAGGCGC	AGCGGTCCGG	CTGAACGGGG
2101	GGTTCGTGCA	CACAGCCCAG	CTTGGAGCGA	ACGACCTACA	CCGAAGTCTG	ATACCTACAG
2161	CGTGAGCTAT	GAGAAAGCGC	CACGCTTCCC	GAAAGGAGAA	AGGCGGACAG	GTATCCGGTA
2221	AGCGGCAGGG	TCGGAACAGG	AGAGCGCACG	AGGGAGCTTC	CAGGGGGAAA	CGCCTGGTAT
2281	CTTTATAGTC	CTGTCGGGTT	TCGCCACCTC	TGACTTGAGC	GTCGATTTTT	GTGATGCTCG
2341	TCAGGGGGGG	GGAGCCTATG	GAAAAACGCC	AGCAACGCGG	CCTTTTTTACG	GTTTCTGGCC
2401	TTTTGCTGGC	CTTTTGCTCA	CATGTTCTTT	CCTGCGTTAT	CCCCTGATTC	TGTGGATAAC
2461	CGTATTACCG	CTAGCATGGA	TCTCGGGGAC	GTCTAACTAC	TAAGCGAGAG	TAGGGAACTG
2521	CCAGGCATCA	AATAAAACGA	AAGGCTCAGT	CGGAAGACTG	GGCCTTTCGT	TTTATCTGTT
2581	GTTTGTCGGT	GAACGCTCTC	CTGAGTAGGA	CAAATCCGCC	GGGAGCGGAT	TTGAACGTTG
2641	TGAAGCAACG	GCCCGGAGGG	TGGCGGGCAG	GACGCCCGCC	ATAAACTGCC	AGGCATCAAA
2701	CTAAGCAGAA	GGCCATC				

FIG.10B

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Cloning Sites of the Entry Vector pENTR2B (reading frame B)

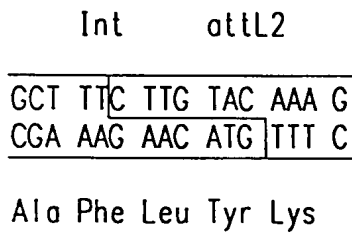
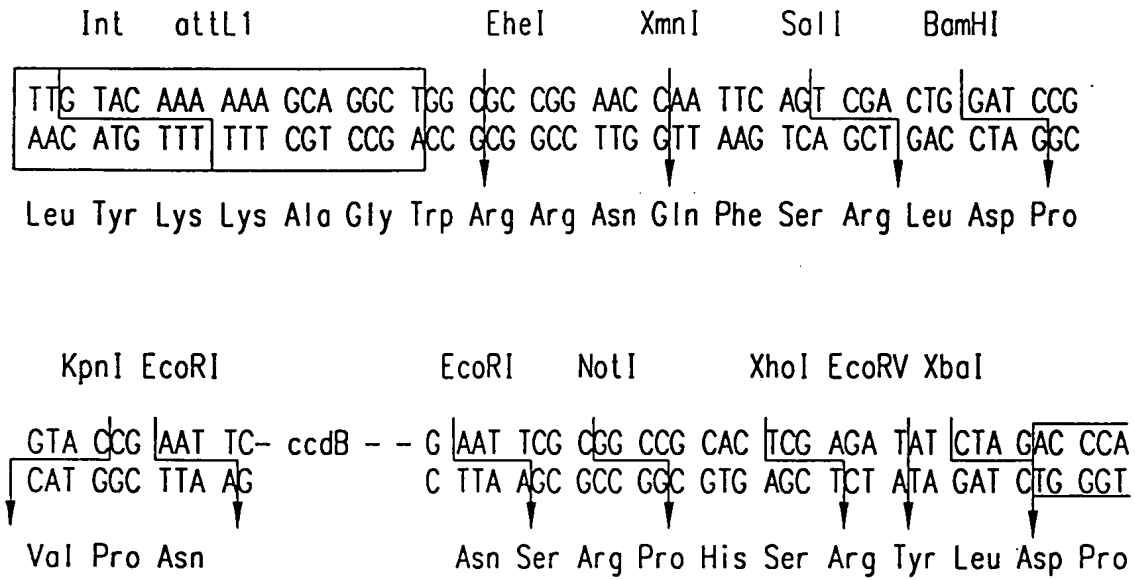


FIG.11A

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pENTR2B 2718 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
322..627	ccdB
656..755	attL2
878..1687	KmR
1792..2365	ori

```

1 CTGACGGATG GCCTTTTTGC GTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTGGCG CCGGAACCAA
181 TTCAGTCGAC TGGATCCGGT ACCGAATTCG CTTACTAAAA GCCAGATAAC AGTATGCGTA
241 TTTGCGCGCT GATTTTTCG GTATAAGAA ATATACTGAT ATGTATACCC GAAGTATGTC
301 AAAAAGAGGT GTGCTTCTAG AATGCAGTTT AAGGTTTACA CCTATAAAG AGAGAGCCGT
361 TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA CGCCCGGGCG ACGGATGGTG
421 ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT CCCGTGAAC TTACCCGGTG
481 GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG ATATGGCCAG TGTGCCGGTC
541 TCCGTTATCG GGAAGAAGT GGCTGATCTC AGCCACCGCG AAAATGACAT CAAAAACGCC
601 ATTAACCTGA TGTTCTGGGG AATATAGAAT TCGCGGCCGC ACTCGAGATA TCTAGACCCA
661 GCTTCTTGT ACAAAGTTGG CATTATAAGA AAGCATTGCT TATCAATTTG TTGCAACGAA
721 CAGGTCATA TCAGTCAAAA TAAAATCATT ATTTGCCATC CAGCTGCAGC TCTGGCCCGT
781 GTCTCAAAAT CTCTGATGTT ACATTGCACA AGATAAAAT ATATCATCAT GAACAATAAA
841 ACTGTCTGCT TACATAAACA GTAATACAAG GGGTGTATG AGCCATATTC AACGGGAAAC
901 GTCGAGGCCG CGATTAAATT CCAACATGGA TGCTGATTTA TATGGGTATA AATGGGCTCG
961 CGATAATGTC GGGCAATCAG GTGCGACAAT CTATCGCTTG TATGGGAAGC CCGATGCGCC
1021 AGAGTTGTTT CTGAAACATG GCAAAGGTAG CGTTGCCAAT GATGTTACAG ATGAGATGGT
1081 CAGACTAAAC TGGCTGACGG AATTTATGCC TCTCCGACC ATCAAGCATT TTATCCGTAC
1141 TCCTGATGAT GCATGGTTAC TCACCACTGC GATCCCCGGA AAAACAGCAT TCCAGGTATT
1201 AGAAGAATAT CCTGATTGAG GTGAAAATAT TGTTGATGCG CTGGCAGTGT TCCTGCGCCG
1261 GTTGCATTG ATTCTGTGTT GTAATTGTCC TTTTAACAGC GATCGCGTAT TTCGTCTCGC
1321 TCAGGCGCAA TCACGAATGA ATAACGGTTT GGTTGATGCG AGTGATTTTG ATGACGAGCG
1381 TAATCTGTGG CCTGTTGAAC AAGTCTGGAA AGAAATGCAT AAACTTTTGC CATTCTCACC
1441 GGATTCAGTC GTCACTCATG GTGATTTCTC ACTTGATAAC CTTATTTTTG ACGAGGGGAA
1501 ATTAATAGGT TGTATTGATG TTGGACGAGT CGGAATCGCA GACCGATACC AGGATCTTGC
1561 CATCCTATGG AACTGCCTCG GTGAGTTTTT TCCTTCATTA CAGAAACGGC TTTTTCAAAA
1621 ATATGGTATT GATAATCCTG ATATGAATAA ATTGCAGTTT CATTTGATGC TCGATGAGTT
1681 TTTCTAATCA GAATTGGTTA ATTGGTTGTA ACATTATTCA GATTGGGCCC CGTTCCACTG
1741 AGCGTCAGAC CCCGTAGAAA AGATCAAAGG ATCTTCTTGA GATCCTTTTT TTCTGCGCGT
1801 AATCTGCTGC TTGCAAACAA AAAAACCACC GCTACCAGCG GTGGTTTGTT TGCCGGATCA
1861 AGAGCTACCA ACTCTTTTTT CGAAGGTAAC TGGCTTCAGC AGAGCGCAGA TACCAAATAC
1921 TGTTCTTCTA GTGTAGCCGT AGTTAGGCCA CCACTTCAAG AACTCTGTAG CACCGCCTAC
1981 ATACCTCGCT CTGCTAATCC TGTTACCAAG GGCTGCTGCC AGTGGCGATA AGTCGTGTCT
2041 TACCGGGTTG GACTCAAGAC GATAGTTACC GGATAAGGCG CAGCGGTCGG GCTGAACGGG
2101 GGGTTTCGTG ACACAGCCCA GCTTGGAGCG AACGACCTAC ACCGAAGTGA GATACCTACA
2161 GCGTGAGCTA TGAGAAAGCG CCAGCCTTCC CGAAGGGAGA AAGGCGGAGA GGTATCCGGT
2221 AAGCGGACAG GTCGGAACAG GAGAGCGCAC GAGGGAGCTT CCAGGGGGAA ACGCCTGGTA
2281 TCTTTATAGT CCTGTCGGGT TTCGCCACCT CTGACTTGAG CGTCGATTTT TGTGATGCTC
2341 GTCAGGGGGG CGGAGCCTAT GGAAAAACGC CAGCAACGCG GCCTTTTTAC GGTTCTTGGC
2401 CTTTTGCTGG CTTTTGCTC ACATGTTCTT TCCTGCGTTA TCCCCTGATT CTGTGGATAA
2461 CCGTATTACC GCTAGCATGG ATCTCGGGGA CGTCTAACTA CTAAGCGAGA GTAGGGAAC
2521 GCCAGGCATC AAATAAAACG AAAGGCTCAG TCGGAAGACT GGGCCTTTTC TTTTATCTGT
2581 TGTTTGTGCG TGAACGCTCT CCTGAGTAGG ACAAATCCGC CGGGAGCGGA TTTGAACGTT
2641 GTGAAGCAAC GGCCCGGAGG GTGGCGGGCA GGACGCCCGC CATAAACTGC CAGGCATCAA
2701 ACTAAGCAGA AGGCCATC

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FIG. 11B

Cloning Sites of the Entry Vector pENTR3C (reading frame C)

Int attL1 DraI XmnI SalI BamHI

TTG	TAC	AAA	AAA	GCA	GGC	TCT	TTA	AAG	GAA	COA	ATT	CAG	TCG	ACT	GGA	TCC	GGT
AAC	ATG	TTT	TTT	CGT	CCG	AGA	AAT	TTC	CTT	GGT	TAA	GTC	AGC	TGA	CCT	AGG	CCA

Leu Tyr Lys Lys Ala Gly Ser Leu Lys Glu Pro Ile Gln Ser Thr Gly Ser Gly

KpnI EcoRI PvuI EcoRI NotI XhoI EcoRV XbaI

ACC	GAA	TTC	GAT	GGC	—	ccdB	—	G	AAT	TCG	GGG	CCG	CAC	TCG	AGA	TAT	CTA
TGG	CTT	AAG	CTA	GCG				C	TTA	AGC	GCC	GGC	GTG	AGC	TCT	ATA	GAT

Thr Glu Phe Asn Ser Arg Pro His Ser Arg Tyr Leu

attL2 Int

GAC	CCA	GCT	TTG	TTG	TAC	AAA	G
CTG	GGT	CGA	AAG	AAC	ATG	TTT	C

Asp Pro Ala Phe Leu Tyr Lys

FIG.12A

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pENTR3C 2723 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
327..632	ccdB
661..760	attL2
883..1692	KmR
1797..2370	ori

1	CTGACGGATG	GCCTTTTTGC	GTTTCTACAA	ACTCTTCCTG	TTAGTTAGTT	ACTTAAGCTC
61	GGGCCCCAAA	TAATGATTTT	ATTTTGACTG	ATAGTGACCT	GTTTCGTTGCA	ACAAATTGAT
121	AAGCAATGCT	TTTTTATAAT	GCCAACTTTG	TACAAAAAAG	CAGGCTCTTT	AAAGGAACCA
181	ATTCAGTCGA	CTGGATCCGG	TACCGAATTC	GATCGCTTAC	TAAAAGCCAG	ATAACAGTAT
241	GCGTATTTGC	GCGCTGATTT	TTGCGGTATA	AGAATATATA	CTGATATGTA	TACCCGAAGT
301	ATGTCAAAAA	GAGGTGTGCT	TCTAGAATGC	AGTTTAAGGT	TTACACCTAT	AAAAGAGAGA
361	GCCGTTATCG	TCTGTTTGTG	GATGTACAGA	GTGATATTAT	TGACACGCC	GGGCGACGGA
421	TGGTGATCCC	CCTGGCCAGT	GCACGTCTGC	TGTCAGATAA	AGTCTCCCGT	GAACCTTACC
481	CGGTGGTGCA	TATCGGGGAT	GAAAGCTGGC	GCATGATGAC	CACCGATATG	GCCAGTGTGC
541	CGGTCTCCGT	TATCGGGGAA	GAAGTGGCTG	ATCTCAGCCA	CCGCGAAAAT	GACATCAAAA
601	ACGCCATTAA	CCTGATGTTT	TGGGGAATAT	AGAATTCGCG	GCCGCACTCG	AGATATCTAG
661	ACCCAGCTTT	CTTGTACAAA	GTTGGCATT	TAAGAAAGCA	TTGCTTATCA	ATTTGTTGCA
721	ACGAACAGGT	CACTATCAGT	CAAAATAAAA	TCATTATTTG	CCATCCAGCT	GCAGCTCTGG
781	CCCGTGTCTC	AAAATCTCTG	ATGTTACATT	GCACAAGATA	AAAATATATC	ATCATGAACA
841	ATAAACTGT	CTGCTTACAT	AAACAGTAAT	ACAAGGGGTG	TTATGAGCCA	TATTCAACGG
901	GAAACGTCGA	GGCCGCGATT	AAATCCAAC	ATGGATGCTG	ATTTATATGG	GTATAAATGG
961	GCTCGCGATA	ATGTCGGGCA	ATCAGGTGCG	ACAATCTATC	GCTTGTATGG	GAAGCCCGAT
1021	GCGCCAGAGT	TGTTTCTGAA	ACATGGCAAA	GGTAGCGTTG	CCAATGATGT	TACAGATGAG
1081	ATGGTCAGAC	TAAACTGGCT	GACGGAATTT	ATGCCTCTTC	CGACCATCAA	GCATTTTATC
1141	CGTACTCCTG	ATGATGCATG	GTTACTCACC	ACTGCGATCC	CCGGAAAAAC	AGCATTCCAG
1201	GTATTAGAAG	AATATCCTGA	TTCAGGTGAA	AATATTGTTG	ATGCGCTGGC	AGTGTTCTCTG
1261	CGCCGGTTGC	ATTCGATTCC	TGTTTGTAA	TGTCCTTTTA	ACAGCGATCG	CGTATTTCTG
1321	CTCGCTCAGG	CGCAATCACG	AATGAATAAC	GGTTTGGTTG	ATGCGAGTGA	TTTTGATGAC
1381	GAGCGTAATG	GCTGGCCTGT	TGAACAAGTC	TGGAAAGAAA	TGCATAAACT	TTTGCCATTC
1441	TCACCGGATT	CAGTCGTCAC	TCATGGTGAT	TTCTCACTTG	ATAACCTTAT	TTTTGACGAG
1501	GGGAAATTAA	TAGGTTGTAT	TGATGTTGGA	CGAGTCGGAA	TCGCAGACCG	ATACCAGGAT
1561	CTTGCCATCC	TATGGAAGT	CCTCGGTGAG	TTTTCTCCTT	CATTACAGAA	ACGGCTTTTT
1621	CAAAAATATG	GTATTGATAA	TCCTGATATG	AATAAATTGC	AGTTTCATTT	GATGCTCGAT
1681	GAGTTTTTCT	AATCAGAATT	GGTTAATTGG	TTGTAACATT	ATTCAGATTG	GGCCCCGTTT
1741	CACTGAGCGT	CAGACCCCGT	AGAAAAGATC	AAAGGATCTT	CTTGAGATCC	TTTTTTTCTG
1801	CGCGTAATCT	GCTGCTTGCA	AACAAAAAAA	CCACCGCTAC	CAGCGGTGGT	TTGTTTGCCG
1861	GATCAAGAGC	TACCAACTCT	TTTTCCGAAG	GTAAGTGGCT	TCAGCAGAGC	GCAGATACCA
1921	AATACTGTTT	TTCTAGTGTA	GCCGTAGTTA	GGCCACCACT	TCAAGAACTC	TGTAGCACCG
1981	CCTACATACC	TCGCTCTGCT	AATCCTGTTA	CCAGTGGCTG	CTGCCAGTGG	CGATAAGTCG
2041	TGTCTTACCG	GGTTGGACTC	AAGACGATAG	TTACCGGATA	AGGCGCAGCG	GTCGGGCTGA
2101	ACGGGGGGTT	CGTGCACACA	GCCAGCTTGG	GAGCGAACGA	CCTACACCGA	ACTGAGATAC
2161	CTACAGCGTG	AGCTATGAGA	AAGCGCCACG	CTTCCCAGAG	GGAGAAAGGC	GGACAGGTAT
2221	CCGGTAAGCG	GCAGGGTTCG	AACAGGAGAG	CGCACGAGGG	AGCTTCCAGG	GGGAAACGCC
2281	TGGTATCTTT	ATAGTCCTGT	CGGGTTTCGC	CACCTCTGAC	TTGAGCGTCG	ATTTTTGTGA
2341	TGCTCGTCAG	GGGGGCGGAG	CCTATGGAAA	AACGCCAGCA	ACGCGGCCTT	TTTACGGTTC
2401	CTGGCCTTTT	GCTGGCCTTT	TGCTCACATG	TTCTTTTCTG	CGTTATCCCC	TGATTCTGTG
2461	GATAACCGTA	TTACCGCTAG	CATGGATCTC	GGGGACGTCT	AACTACTAAG	CGAGAGTAGG
2521	GAAGTCCAG	GCATCAAATA	AAACGAAAGG	CTCAGTCGGA	AGACTGGGCC	TTTCGTTTTA
2581	TCTGTTGTTT	GTCGGTGAAC	GCTCTCCTGA	GTAGGACAAA	TCCGCCGGGA	GCGGATTTGA
2641	ACGTTGTGAA	GCAACGGCCC	GGAGGGTGGC	GGGCAGGACG	CCCGCCATAA	ACTGCCAGGC
2701	ATCAAATAA	GCAGAAGGCC	ATC			

FIG.12B

Cloning Sites of the Entry Vector pENTR4

Int attL1 NcoI Kozak XmnI SalI BamHI

```

TTG TAC AAA AAA GCA GGC TCC ACC ATG GGA ACC AAT TCA GTC GAC TGG ATC CGG
AAC ATG TTT TTT CGT CCG AGG TGG TAC CCT TGG TTA AGT CAG CTG ACC TAG GCC

```

Leu Tyr Lys Lys Ala Gly Ser Thr Met Gly Thr Asn Ser Val Asp Trp Ile Arg

KpnI EcoRI EcoRI NotI XhoI EcoRV XbaI

```

TAC CGA ATT C --- ccdB --- G AAT TCG CCG CCG CAC TCG AGA TAT CTA GAC CCA GCT
ATG GCT TAA G C TTA AGC GCC GGC GTG AGC TCT ATA GAT CTG GGT CGA

```

Tyr Arg Ile Asn Ser Arg Pro His Ser Arg Tyr Leu Asp Pro Ala

Int attL2

```

TTC TTG TAC AAA G
AAG AAC ATG TTT C

```

Phe Leu Tyr Lys

FIG.13A

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pENTR4 2720 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
324..629	ccdB
658..757	attL2
880..1689	KmR
1794..2367	ori

```

1 CTGACGGATG GCCTTTTTTG GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTCCAC CATGGGAACC
181 AATTCAGTCG ACTGGATCCG GTACCGAATT CGCTTACTAA AAGCCAGATA ACAGTATGCG
241 TATTTGCGCG CTGATTTTGT CGGTATAAGA ATATATACTG ATATGTATAC CCGAAGTATG
301 TCAAAAAGAG GTGTGCTTCT AGAATGCAGT TTAAGGTTTA CACCTATAAA AGAGAGAGCC
361 GTTATCGTCT GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCGGG CGACGGATGG
421 TGATCCCCCT GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA CTTTACCCGG
481 TGGTGCAATAT CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC AGTGTGCCGG
541 TCTCCGTTAT CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC ATCAAAAACG
601 CCATTAACCT GATGTTCTGG GGAATATAGA ATTCGCGGCC GCACTCGAGA TATCTAGACC
661 CAGCTTCTT GTACAAAGTT GGCATTATAA GAAAGCATTG CTTATCAATT TGTGCAACG
721 AACAGGTCAC TATCAGTCAA AATAAAATCA TTATTTGCCA TCCAGCTGCA GCTCTGGCCC
781 GTGTCTCAAA ATCTCTGATG TTACATTGCA CAAGATAAAA ATATATCATC ATGAACAATA
841 AAAGTGTCTG CTTACATAAA CAGTAATACA AGGGGTGTTA TGAGCCATAT TCAACGGGAA
901 ACGTCGAGGC CGCGATTAAA TTCCAACATG GATGCTGATT TATATGGGTA TAAATGGGCT
961 CGCGATAATG TCGGGCAATC AGGTGCGACA ATCTATCGCT TGTATGGGAA GCCCGATGCG
1021 CCAGAGTTGT TTCTGAAACA TGGCAAAGGT AGCGTTGCCA ATGATGTTAC AGATGAGATG
1081 GTCAGACTAA ACTGGCTGAC GGAATTTATG CCTCTTCCGA CCATCAAGCA TTTTATCCGT
1141 ACTCCTGGTG ATGCATGGTT ACTCACCCT GCGATCCCCG GAAAAACAGC ATTCCAGGTA
1201 TTAGAAGAAT ATCCTGATTC AGGTGAAAAT ATTGTTGATG CGCTGGCAGT GTTCCTGCGC
1261 CGGTTGCATT CGATTCTGT TTGTAATTGT CCTTTTAACA GCGATCGCGT ATTTCTGCTC
1321 GCTCAGGCGC AATCACGAAT GAATAACGGT TTGGTTGATG CGAGTGATT TGATGACGAG
1381 CGTAATGGCT GGCCTGTTGA ACAAGTCTGG AAAGAAATGC ATAAACTTTT GCCATTCTCA
1441 CCGGATTGAG TCGTCACTCA TGGTGATTTC TCACCTGATA ACCTTATTTT TGACGAGGGG
1501 AAATTAATAG GTTGATTGTA TGTGGACGA GTCGGAATCG CAGACCGATA CCAGGATCTT
1561 GCCATCCTAT GGAAGTGCCT CGGTGAGTTT TCTCCTTCAT TACAGAAACG GCTTTTTCAA
1621 AAATATGGTA TTGATAATCC TGATATGAAT AAATTGCAGT TTCATTTGAT GCTCGATGAG
1681 TTTTCTAAT CAGAATTGGT TAATTGGTTG TAACATTATT CAGATTGGGC CCCGTTCCAC
1741 TGAGCGTCAG ACCCGTAGA AAAGATCAAA GGATCTTCTT GAGATCCTTT TTTTCTGCGC
1801 GTAATCTGCT GCTTGCAAAC AAAAAAACCA CCGCTACCA GCGTGGTTTG TTTGCCGGAT
1861 CAAGAGCTAC CAACTCTTTT TCCGAAGGTA ACTGGCTTCA GCAGAGCGCA GATACCAAAT
1921 ACTGTTCTTC TAGTGTAGCC GTAGTTAGGC CACCACTTCA AGAACTCTGT AGCACCGCCT
1981 ACATACCTCG CTCTGCTAAT CCTGTTACCA GTGGCTGCTG CCAGTGGCGA TAAGTCGTGT
2041 CTTACCGGGT TGGACTCAAG ACGATAGTTA CCGGATAAGG CGCAGCGGTC GGGCTGAACG
2101 GGGGGTTTCGT GCACACAGCC CAGCTTGGAG CGAACGACCT ACACCGAACT GAGATACCTA
2161 CAGCGTGAGC TATGAGAAAG CGCCACGCTT CCCGAAGGGA GAAAGGCGGA CAGGTATCCG
2221 GTAAGCGGCA GGGTCGGAAC AGGAGAGCGC ACAGGGGAGC TTCCAGGGGG AAACGCCTGG
2281 TATCTTTATA GTCCTGTCGG GTTTCGCCAC CTCTGACTTG AGCGTCGATT TTTGTGATGC
2341 TCGTCAGGGG GCGGAGCCCT ATGGAAAAAC GCCAGCAACG CGGCCTTTTT ACGGTTCTGT
2401 GCCTTTTGCT GGCTTTTGCT TCACATGTTT TTTCTGCGT TATCCCCTGA TTCTGTGGAT
2461 AACCCTATTA CCGCTAGCAT GGATCTCGGG GACGTCTAAC TACTAAGCGA GAGTAGGGAA
2521 CTGCCAGGCA TCAAATAAAA CGAAAGGCTC AGTCGGAAGA CTGGGCCTTT CGTTTTATCT
2581 GTTGTTTGTC GGTGAACGCT CTCCTGAGTA GGACAAATCC GCCGGGAGCG GATTTGAACG
2641 TTGTGAAGCA ACGGCCGGA GGGTGGCGGG CAGGACGCCC GCCATAAACT GCCAGGCATC
2701 AACTAAGCA GAAGGCCATC

```

FIG. 13B

Cloning sites of the Entry Vector pENTR5

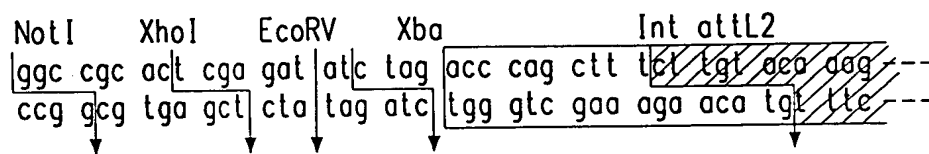
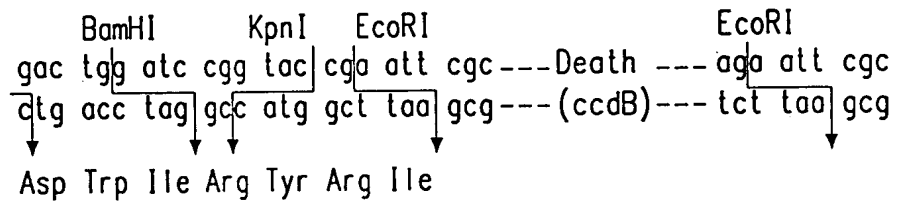
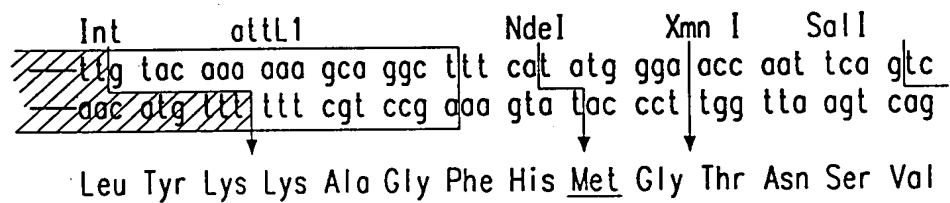


FIG.14A

19/253

pENTR5 2720 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
324..629	ccdB
658..757	attL2
880..1689	KmR
1794..2367	ori

1	CTGACGGATG	GCCTTTTTGC	GTTTCTACAA	ACTCTTCCTG	TTAGTTAGTT	ACTTAAGCTC
61	GGGCCCCAAA	TAATGATTTT	ATTTTGACTG	ATAGTGACCT	GTTTCGTTGCA	ACAAATTGAT
121	AAGCAATGCT	TTTTTATAAT	GCCAACTTTG	TACAAAAAAG	CAGGCTTTCA	TATGGGAACC
181	AATTCAGTCG	ACTGGATCCG	GTACCGAATT	CGCTTACTAA	AAGCCAGATA	ACAGTATGCG
241	TATTTGCGCG	CTGATTTTTG	CGGTATAAGA	ATATATACTG	ATATGTATAC	CCGAAGTATG
301	TCAAAAAGAG	GTGTGCTTCT	AGAATGCAGT	TAAAGGTTTA	CACCTATAAA	AGAGAGAGCC
361	GTTATCGTCT	GTTTGTGGAT	GTACAGAGTG	ATATTATTGA	CACGCCCGGG	CGACGGATGG
421	TGATCCCCCT	GGCCAGTGCA	CGTCTGCTGT	CAGATAAAGT	CTCCCGTGAA	CTTTACCCGG
481	TGGTGCAAT	CGGGGATGAA	AGCTGGCGCA	TGATGACCAC	CGATATGGCC	AGTGTGCCGG
541	TCTCCGTTAT	CGGGGAAGAA	GTGGCTGATC	TCAGCCACCG	CGAAAATGAC	ATCAAAAACG
601	CCATTAACCT	GATGTTCTGG	GGAATATAGA	ATTCGCGGCC	GCACTCGAGA	TATCTAGACC
661	CAGCTTTCTT	GTACAAAGTT	GGCATTATAA	GAAAGCATTG	CTTATCAATT	TGTTGCAACG
721	AACAGGTCAC	TATCAGTCAA	AATAAAATCA	TTATTTGCCA	TCCAGCTGCA	GCTCTGGCCC
781	GTGTCTCAAA	ATCTCTGATG	TTACATTGCA	CAAGATAAAA	ATATATCATC	ATGAACAATA
841	AAACTGTCTG	CTTACATAAA	CAGTAATACA	AGGGGTGTTA	TGAGCCATAT	TCAACGGGAA
901	ACGTCGAGGC	CGCGATTAAA	TTCCAACATG	GATGCTGATT	TATATGGGTA	TAAATGGGCT
961	CGCGATAATG	TCGGGCAATC	AGGTGCGACA	ATCTATCGCT	TGTATGGGAA	GCCCGATGCG
1021	CCAGAGTTGT	TTCTGAAACA	TGGCAAAGGT	AGCGTTGCCA	ATGATGTTAC	AGATGAGATG
1081	GTCAGACTAA	ACTGGCTGAC	GGAATTTATG	CCTCTTCCGA	CCATCAAGCA	TTTTATCCGT
1141	ACTCCTGATG	ATGCATGGTT	ACTCACCCT	GCGATCCCCG	GAAAAACAGC	ATTCCAGGTA
1201	TTAGAAGAAT	ATCCTGATTC	AGGTGAAAAT	ATTGTTGATG	CGCTGGCAGT	GTTCTGCGC
1261	CGGTTGCATT	CGATTCCTGT	TTGTAATTGT	CCTTTTAACA	GCGATCGCGT	ATTTCTGCTC
1321	GCTCAGGCGC	AATCACGAAT	GAATAACGGT	TTGGTTGATG	CGAGTGATTT	TGATGACGAG
1381	CGTAATGGCT	GGCCTGTTGA	ACAAGTCTGG	AAAGAAATGC	ATAAACTTTT	GCCATTCTCA
1441	CCGATTTCAG	TCGTCACTCA	TGGTGATTTT	TCACCTTGATA	ACCTTATTTT	TGACGAGGGG
1501	AAATTAATAG	GTTGTATTGA	TGTTGGACGA	GTCGGAATCG	CAGACCGATA	CCAGGATCTT
1561	GCCATCCTAT	GGAACCTGCT	CGGTGAGTTT	TCTCCTTCAT	TACAGAAACG	GCTTTTTCAA
1621	AAATATGGTA	TTGATAATCC	TGATATGAAT	AAATTGCAGT	TTCAATTTGAT	GCTCGATGAG
1681	TTTTTCTAAT	CAGAATTGGT	TAATTGGTTG	TAACATTATT	CAGATTGGGC	CCCGTTCCAC
1741	TGAGCGTCAG	ACCCCGTAGA	AAAGATCAAA	GGATCTTCTT	GAGATCCTTT	TTTTCTGCGC
1801	GTAATCTGCT	GCTTGCAAAC	AAAAAAACCA	CCGCTACCAG	CGGTGGTTTG	TTTGCCGGAT
1861	CAAGAGCTAC	CAACTCTTTT	TCCGAAGGTA	ACTGGCTTCA	GCAGAGCGCA	GATACCAAAT
1921	ACTGTTCTTC	TAGTGTAGCC	GTAGTTAGGC	CACCACTTCA	AGAACTCTGT	AGCACCGCCT
1981	ACATACCTCG	CTCTGCTAAT	CCTGTTAGCA	GTGGCTGCTG	CCAGTGCGCA	TAAGTCGTGT
2041	CTTACCGGGT	TGGACTCAAG	ACGATAGTTA	CCGGATAAGG	CGCAGCGGTC	GGGCTGAACG
2101	GGGGGTTCTG	GCACACAGCC	CAGCTTGAGG	CGAACGACCT	ACACCGAACT	GAGATACCTA
2161	CAGCGTGAGC	TATGAGAAAG	CGCCACGCTT	CCCGAAGGGA	GAAAGGCGGA	CAGGTATCCG
2221	GTAAGCGGCA	GGGTCGGAAC	AGGAGAGCGC	ACGAGGGAGC	TTCCAGGGGG	AAACGCCTGG
2281	TATCTTTATA	GTCCTGTCGG	GTTTCGCCAC	CTCTGACTTG	AGCGTCGATT	TTTGTGATGC
2341	TCGTACGGGG	GGCGGAGCCT	ATGGAAAAAC	GCCAGCAACG	CGGCCTTTTT	ACGGTTCCTG
2401	GCCTTTTGCT	GGCCTTTTGC	TCACATGTTT	TTTCCTGCGT	TATCCCCTGA	TTCTGTGGAT
2461	AACCGTATTA	CCGCTAGCAT	GGATCTCGGG	GACGTCTAAC	TACTAAGCGA	GAGTAGGGAA
2521	CTGCCAGGCA	TCGAATAAAA	CGAAAGGCTC	AGTCGGAAGA	CTGGGCCTTT	CGTTTTATCT
2581	GTTGTTTGTG	GGTGAACGCT	CTCCTGAGTA	GGACAAATCC	GCCGGGAGCG	GATTTGAACG
2641	TTGTGAAGCA	ACGGCCCGGA	GGGTGGCGGG	CAGGACGCCC	GCCATAAACT	GCCAGGCATC
2701	AAACTAAGCA	GAAGGCCATC				

FIG.14B

Cloning sites of the Entry Vector pENTR6

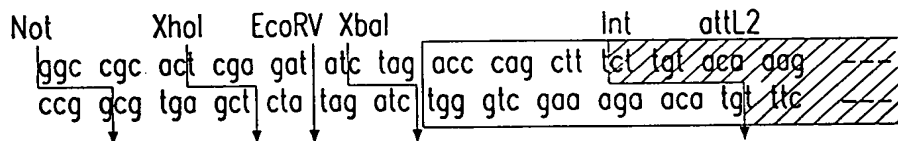
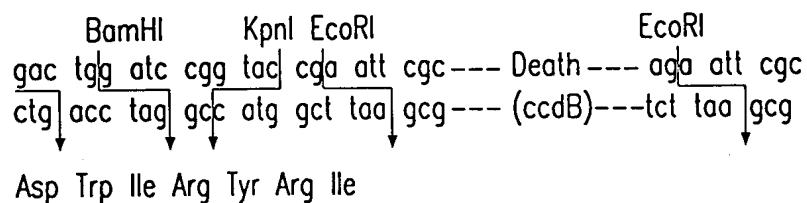
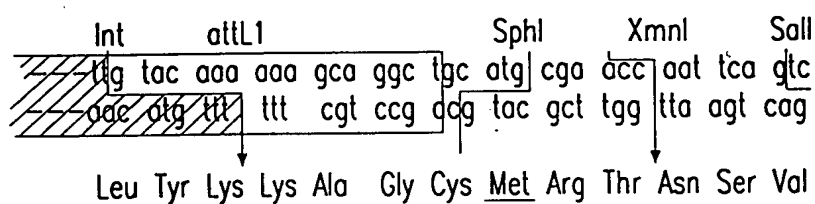


FIG. 15A

21/253

pENTR6 2717 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
321..626	ccdB
655..754	attL2
877..1686	KmR
1791..2364	ori

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1 CTGACGGATG GCCTTTTTTG GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTGCAT GCGAACCAAT
181 TCAGTCGACT GGATCCGGTA CCGAATTCGC TTAATAAAAG CCAGATAACA GTATGCGTAT
241 TTGCGCGCTG ATTTTTCGGG TATAAGAATA TATACTGATA TGTATACCCG AAGTATGTCA
301 AAAAGAGGTG TGCTTCTAGA ATGCAGTTTA AGGTTTACAC CTATAAAAGA GAGAGCCGTT
361 ATCGTCTGTT TGTGGATGTA CAGAGTGATA TTATTGACAC GCCCGGGCGA CGGATGGTGA
421 TCCCCCTGGC CAGTGCACGT CTGCTGTCAG ATAAAGTCTC CCGTGAACCT TACCCGGTGG
481 TGCATATCGG GGATGAAAGC TGGCGCATGA TGACCACCGA TATGGCCAGT GTGCCGGTCT
541 CCGTTATCGG GGAAGAAGTG GCTGATCTCA GCCACCGCGA AAATGACATC AAAAACGCCA
601 TTAACCTGAT GTTCTGGGGA ATATAGAATT CGCGGCCGCA CTCGAGATAT CTAGACCCAG
661 CTTTCTTGTA CAAAGTTGGC ATTATAAGAA AGCATTGCTT ATCAATTTGT TGCAACGAAC
721 AGGTCACTAT CAGTCAAAT AAAATCATT TTTGCCATCC AGCTGCAGCT CTGGCCCGTG
781 TCTCAAATC TCTGATGTTA CATTGCACAA GATAAAAATA TATCATCATG AACAAATAAA
841 CTGTCTGCTT ACATAAACAG TAATACAAGG GGTGTTATGA GCCATATTCA ACGGGAAACG
901 TCGAGGCCGC GATTAAATTC CAACATGGAT GCTGATTTAT ATGGGTATAA ATGGGCTCGC
961 GATAATGTCG GGCAATCAGG TGCACAATC TATCGCTTGT ATGGGAAGCC CGATGCGCCA
1021 GAGTTGTTTC TGAAACATGG CAAAGGTAGC GTTGCCAATG ATGTTACAGA TGAGATGGTC
1081 AGACTAACT GGCTGACGGA ATTTATGCCT CTTCCGACCA TCAAGCATT TATCCGTACT
1141 CCTGATGATG CATGGTTACT CACCACTGCG ATCCCCGGA AAACAGCATT CCAGGTATTA
1201 GAAGAATATC CTGATTCAGG TGAAAATATT GTTGATGCGC TGGCAGTGT CCTGCGCCGG
1261 TTGCATTCGA TTCCTGTTTG TAATTGTCCT TTTAACAGCG ATCGCGTATT TCGTCTCGCT
1321 CAGGCGCAAT CACGAATGAA TAACGGTTTG GTTGATGCGA GTGATTTTGA TGACGAGCGT
1381 AATGGCTGGC CTGTTGAACA AGTCTGGAAG GAAATGCATA AACTTTTGCC ATTCTCACC
1441 GATTACAGTC TCACTCATGT TGATTTCTCA CTTGATAACC TTATTTTGA CGAGGGGAAA
1501 TTAATAGGTT GTATTGATGT TGGACGATC GGAATCGCAG ACCGATACCA GGATCTTGCC
1561 ATCCTATGTT ACTGCCTCGG TGAGTTTCT CCTTCATTAC AGAAACGGCT TTTTCAAAAA
1621 TATGGTATTG ATAATCCTGA TATGAATAAA TTGCAGTTTC ATTTGATGCT CGATGAGTTT
1681 TTCTAATCAG AATTGGTTAA TTGGTTGTAA CATTATTCAG ATTGGGCCCC GTTCCACTGA
1741 GCGTCAGACC CCGTAGAAAA GATCAAAGGA TCTTCTTGAG ATCCTTTTTT TCTGCGCGTA
1801 ATCTGCTGCT TGCAAACAAA AAAACCACCG CTACCAGCGG TGGTTTGTTC GCCGGATCAA
1861 GAGCTACCAA CTCTTTTTCC GAAGGTAAC GGCTTCAGCA GAGCGCAGAT ACCAAATACT
1921 GTTCTTCTAG TGTAGCCGTA GTTAGGCCAC CACTTCAAGA ACTCTGTAGC ACCGCCTACA
1981 TACCTCGCTC TGCTAATCCT GTTACCAAGT GCTGCTGCCA GTGGCGATAA GTCGTGTCTT
2041 ACCGGGTTGG ACTCAAGACG ATAGTTACCG GATAAGGCGC AGCGGTCGGG CTGAACGGGG
2101 GGTTTCGTGCA CACAGCCCAG CTTGGAGCGA ACGACCTACA CCGAACTGAG ATACCTACAG
2161 CGTGAGCTAT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA AGGCGGACAG GTATCCGGTA
2221 AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC CAGGGGAAA CGCCTGGTAT
2281 CTTTATAGTC CTGTCGGGTT TCGCCACCTC TGACTTGAGC GTCGATTTT GTGATGTCG
2341 TCAGGGGGGG GGAGCCTATG GAAAAACGCC AGCAACGCGG CTTTTTACG GTTCTGGCC
2401 TTTTGCTGGC CTTTGTCTCA CATGTTCTTT CTTGCGTTAT CCCCTGATT CCTGATAAC
2461 CGTATTACCG CTAGCATGGA TCTCGGGGAC GTCTAACTAC TAAGCGAGAG TAGGGAAGTG
2521 CCAGGCATCA AATAAACGAA AAGGCTCAGT CGGAAGACTG GGCCTTTCGT TTTATCTGTT
2581 GTTTGTCTGGT GAACGCTCTC CTGAGTAGGA CAAATCCGCC GGGAGCGGAT TTGAACGTTG
2641 TGAAGCAACG GCCCGGAGGG TGCGGGGCGA GACGCCCGCC ATAACTGCC AGGCATCAAA
2701 CTAAGCAGAA GGCCATC

```

FIG.15B

Cloning sites of the Entry Vector pENTR7

attL1

```

---ttg tac aaa aaa gca ggc ttt gaa aac ctg tat ttt coa gga
---aac atg ttt ttt cgt ccg aaa ctt ttg gac ata aaa gtt cct

```

Leu Tyr Lys Lys Ala Gly Phe Glu Asn Leu Tyr Phe Gln Gly

TEV Protease

XmnI SalI Bam KpnI EcoRI

```

acc|ggt tca tgc atc gtc gac tgg atc cgg tac|cga att cgc ---
tgg|caa agt acg tag cag ctg acc tag gcc atg gct taq|gcg ---

```

Thr Val Ser Cys Ile Val Asp Trp Ile Arg Tyr Arg Ile

EcoRI NotI XhoI EcoRV XbaI

```

-Death-|---aga att cgc|ggc cgc act cga gat|atc tag|acc cag
-(ccdB)-|---tct taq|gcc ccg gcc tga gct|cta tag|atc|tgg gtc

```

Int att L2

```

ctt tct tgt aca aag ---
gaa aga aca tgt ttc ---

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FIG.16A

23/253

pENTR7 2738 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
342..647	ccdB
676..775	attL2
898..1707	KmR
1812..2385	ori

1	CTGACGGATG	GCCTTTTTGC	GTTTCTACAA	ACTCTTCCTG	TTAGTTAGTT	ACTTAAGCTC
61	GGGCCCCAAA	TAATGATTTT	ATTTTGACTG	ATAGTGACCT	GTTTCGTTGCA	ACAAATTGAT
121	AAGCAATGCT	TTTTTATAAT	GCCAACTTTG	TACAAAAAAG	CAGGCTTTGA	AAACCTGTAT
181	TTTCAAGGAA	CCGTTTCATG	CATCGTCGAC	TGGATCCGGT	ACCGAATTCG	CTTACTAAAA
241	GCCAGATAAC	AGTATGCGTA	TTTGCGCGCT	GATTTTTGCG	GTATAAGAAT	ATATACTGAT
301	ATGTATACCC	GAAGTATGTC	AAAAAGAGGT	GTGCTTCTAG	AATGCAGTTT	AAGGTTTACA
361	CCTATAAAAG	AGAGAGCCGT	TATCGTCTGT	TTGTGGATGT	ACAGAGTGAT	ATTATTGACA
421	CGCCCGGGCG	ACGGATAGTG	ATCCCCCTGG	CCAGTGCACG	TCTGCTGTCA	GATAAAGTCT
481	CCCGTGAAC	TTACCCGGTG	GTGCATATCG	GGGATGAAAG	CTGGCGCATG	ATGACCACCG
541	ATATGGCCAG	TGTGCCGGTC	TCCGTTATCG	GGGAAGAAGT	GGCTGATCTC	AGCCACCGCG
601	AAAATGACAT	CAAAAACGCC	ATTAACCTGA	TGTTCTGGGG	AATATAGAAT	TCGCGGCCGC
661	ACTCGAGATA	TCTAGACCCA	GCTTTCTTGT	ACAAAGTTGG	CATTATAAGA	AAGCATTGCT
721	TATCAATTTG	TTGCAACGAA	CAGGTCACTA	TCAGTCAAAA	TAAATCATT	ATTTGCCATC
781	CAGCTGCAGC	TCTGGCCCGT	GTCTCAAAAT	CTCTGATGTT	ACATTGCACA	AGATAAAAAT
841	ATATCATCAT	GAACAATAAA	ACTGTCTGCT	TACATAAACA	GTAATACAAG	GGGTGTTATG
901	AGCCATATTC	AACGGGAAAC	GTCGAGGCCG	CGATTAAATT	CCAACATGGA	TGCTGATTTA
961	TATGGGTATA	AATGGGCTCG	CGATAATGTC	GGGCAATCAG	GTGCGACAAT	CTATCGCTTG
1021	TATGGGAAGC	CCGATGCGCC	AGAGTTGTTT	CTGAAACATG	GCAAAGGTAG	CGTTGCCAAT
1081	GATGTTACAG	ATGAGATGGT	CAGACTAAAC	TGGCTGACGG	AATTTATGCC	TCTTCCGACC
1141	ATCAAGCATT	TTATCCGTAC	TCCTGATGAT	GCATGGTTAC	TCACCACTGC	GATCCCCGGA
1201	AAAACAGCAT	TCCAGGTATT	AGAAGAATAT	CCTGATTCAG	GTGAAAATAT	TGTTGATGCG
1261	CTGGCAGTGT	TCCTGCGCCG	GTTGCATTCT	ATTCTGTGTT	GTAATTGTCC	TTTTAACAGC
1321	GATCGCGTAT	TTCGTCTCGC	TCAGGCGCAA	TCACGAATGA	ATAACGGTTT	GGTTGATGCG
1381	AGTGATTTTG	ATGACGAGCG	TAATGGCTGG	CCTGTTGAAC	AAGTCTGGAA	AGAAATGCAT
1441	AAACTTTTGC	CATTCTCACC	GGATTCAATC	GTCACATCAT	GTGATTTCTC	ACTTGATAAC
1501	CTTATTTTGC	ACGAGGGGAA	ATTAATAGGT	TGTATTGATG	TTGGACGAGT	CGGAATCGCA
1561	GACCGATACC	AGGATCTTGC	CATCCTATGG	AACTGCCTCG	GTGAGTTTTT	TCCTTCATTA
1621	CAGAAACGGC	TTTTTCAAAA	ATATGGTATT	GATAATCCTG	ATATGAATAA	ATTGCAGTTT
1681	CATTTGATGC	TCGATGAGTT	TTTCTAATCA	GAATTGGTTA	ATTGGTTGTA	ACATTATTCA
1741	GATTGGGCCC	CGTTCCACTG	AGCGTCAGAC	CCCGTAGAAA	AGATCAAAGG	ATCTTCTTGA
1801	GATCCTTTTT	TTCTGCGCGT	AATCTGCTGC	TTGCAAACAA	AAAAACCACC	GCTACCAGCG
1861	GTGGTTTGTT	TGCCGGATCA	AGAGCTACCA	ACTCTTTTTC	CGAAGGTAAC	TGGCTTCAGC
1921	AGAGCGCAGA	TACCAAATAC	TGTTCTTCTA	GTGTAGCCGT	AGTTAGGCCA	CCACTTCAAG
1981	AACTCTGTAG	CACCGCCTAC	ATACCTCGCT	CTGCTAATCC	TGTTACCAGT	GGCTGTGCC
2041	AGTGGCGATA	AGTCGTGTCT	TACCGGGTTG	GACTCAAGAC	GATAGTTACC	GGATAAGGCG
2101	CAGCGGTCGG	GCTGAACGGG	GGGTTTCGTG	ACACAGCCCA	GCTTGGAGCG	AACGACCTAC
2161	ACCGAACTGA	GATACCTACA	GCGTGAGCTA	TGAGAAAGCG	CCACGCTTCC	CGAAGGGAGA
2221	AAGGCGGACA	GGTATCCGGT	AAGCGGCAGG	GTCGGAACAG	GAGAGCGCAC	GAGGGAGCTT
2281	CCAGGGGGAA	ACGCCTGGTA	TCTTTATAGT	CCTGTCGGGT	TTCGCCACCT	CTGACTTGAG
2341	CGTCGATTTT	TGTGATGCTC	GTCAGGGGGG	CGGAGCCTAT	GGAAAAACGC	CAGCAACGCG
2401	GCCTTTTTAC	GGTTCCTGGC	CTTTTGCTGG	CCTTTTGCTC	ACATGTTCTT	TCCTGCGTTA
2461	TCCCCTGATT	CTGTGGATAA	CCGTATTACC	GCTAGCATGG	ATCTCGGGGA	CGTCTAACTA
2521	CTAAGCGAGA	GTAGGGAAC	GCCAGGCATC	AAATAAAACG	AAAGGCTCAG	TCGGAAGACT
2581	GGGCCTTTTC	TTTTATCTGT	TGTTTGTCGG	TGAACGCTCT	CCTGAGTAGG	ACAAATCCGC
2641	CGGGAGCGGA	TTTGAACGTT	GTGAAGCAAC	GGCCCCGAGG	GTGGCGGGCA	GGACGCCCGC
2701	CATAAACTGC	CAGGCATCAA	ACTAAGCAGA	AGGCCATC		

FIG. 16B

CLONING SITES OF THE ENTRY VECTOR pENTR8

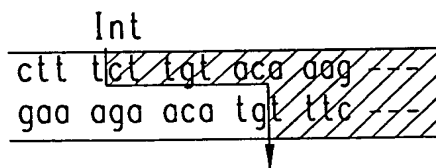
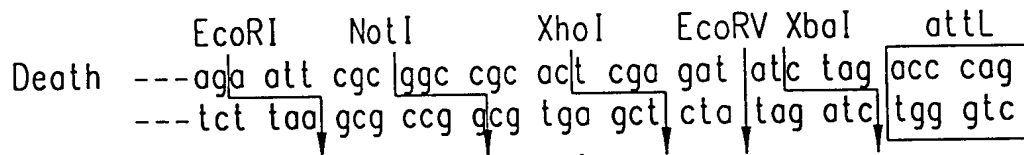
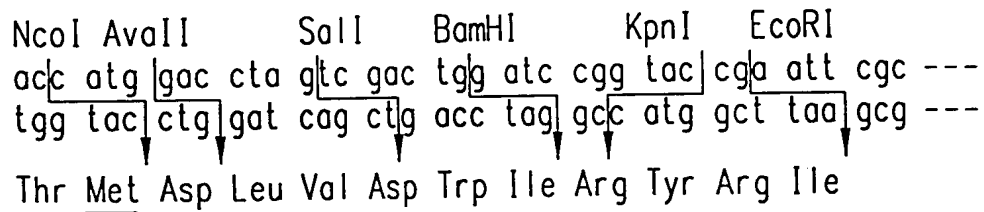
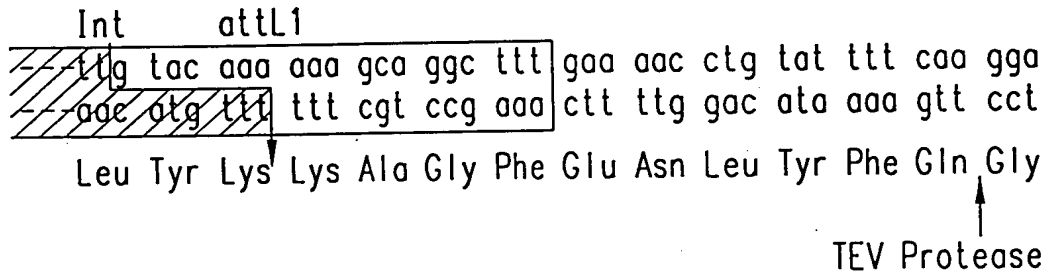


FIG.17A

25/253

pENTR8 2735 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
339..644	ccdB
673..772	attL2
895..1704	KmR
1809..2382	ori

1	CTGACGGATG	GCCTTTTTGC	GTTTCTACAA	ACTCTTCCTG	TTAGTTAGTT	ACTTAAGCTC
61	GGGCCCCAAA	TAATGATTTT	ATTTTGACTG	ATAGTGACCT	GTTTCGTTGCA	ACAAATTGAT
121	AAGCAATGCT	TTTTTATAAT	GCCAACTTTG	TACAAAAAAG	CAGGCTTTGA	AAACCTGTAT
181	TTTCAAGGAA	CCATGGACCT	AGTCGACTGG	ATCCGGTACC	GAATTCGCTT	ACTAAAAGCC
241	AGATAACAGT	ATGCGTATTT	GCGCGCTGAT	TTTTGCGGTA	TAAGAATATA	TACTGATATG
301	TATACCCGAA	GTATGTCAAA	AAGAGGTGTG	CTTCTAGAAT	GCAGTTTAAAG	GTTTACACCT
361	ATAAAAGAGA	GAGCCGTTAT	CGTCTGTTTG	TGGATGTACA	GAGTGATATT	ATTGACACGC
421	CCGGGCGACG	GATAGTGATC	CCCCTGGCCA	GTGCACGTCT	GCTGTCAGAT	AAAGTCTCCC
481	GTGAACTTTA	CCCGGTGGTG	CATATCGGGG	ATGAAAGCTG	GCGCATGATG	ACCACCGATA
541	TGGCCAGTGT	GCCGGTCTCC	GTTATCGGGG	AAGAAGTGGC	TGATCTCAGC	CACCGCGAAA
601	ATGACATCAA	AAACGCCATT	AACCTGATGT	TCTGGGGAAT	ATAGAATTCG	CGGCCGCACT
661	CGAGATATCT	AGACCCAGCT	TTCTTGTACA	AAGTTGGCAT	TATAAGAAAG	CATTGCTTAT
721	CAATTTGTTG	CAACGAACAG	GTCACTATCA	GTCAAAATAA	AATCATTATT	TGCCATCCAG
781	CTGCAGCTCT	GGCCCGTGTC	TCAAAATCTC	TGATGTTACA	TTGCACAAGA	TAAAAATATA
841	TCATCATGAA	CAATAAAACT	GTCTGCTTAC	ATAAACAGTA	ATACAAGGGG	TGTTATGAGC
901	CATATTCAAC	GGGAAACGTC	GAGGCCGCGA	TTAAATTCCA	ACATGGATGC	TGATTTATAT
961	GGGTATAAAT	GGGCTCGCGA	TAATGTCGGG	CAATCAGGTG	CGACAATCTA	TCGCTTGTAT
1021	GGGAAGCCCG	ATGCGCCAGA	GTTGTTTCTG	AAACATGGCA	AAGGTAGCGT	TGCCAATGAT
1081	GTTACAGATG	AGATGGTCAG	ACTAAACTGG	CTGACGGAAT	TTATGCCTCT	TCCGACCATC
1141	AAGCATTTTA	TCCGTACTCC	TGATGATGCA	TGGTTACTCA	CCACTGCGAT	CCCCGGAAAA
1201	ACAGCATTCC	AGGTATTAGA	AGAATATCCT	GATTCAGGTG	AAAATATTGT	TGATGCGCTG
1261	GCAGTGTCCC	TGCGCCGTTT	GCATTTCGATT	CCTGTTTGTA	ATTGTCCTTT	TAACAGCGAT
1321	CGCGTATTTT	GTCTCGCTCA	GGCGCAATCA	CGAATGAATA	ACGGTTTGGT	TGATGCGAGT
1381	GATTTTGATG	ACGAGCGTAA	TGGCTGGCCT	GTTGAACAAG	TCTGGAAAGA	AATGCATAAA
1441	CTTTTGCCAT	TCTCACCGBA	TTCAGTCGTC	ACTCATGGTG	ATTTCTCACT	TGATAACCTT
1501	ATTTTTGACG	AGGGGAAATT	AATAGGTTGT	ATTGATGTTG	GACGAGTCGG	AATCGCAGAC
1561	CGATACCAGG	ATCTTGCCAT	CCTATGGAAC	TGCCTCGGTG	AGTTTTCTCC	TTCATTACAG
1621	AAACGGCTTT	TTCAAAAATA	TGGTATTGAT	AATCCTGATA	TGAATAAATT	GCAGTTTCAT
1681	TTGATGCTCG	ATGAGTTTTT	CTAATCAGAA	TTGGTTAATT	GGTTGTAACA	TTATTTCAGAT
1741	TGGGCCCCGT	TCCACTGAGC	GTCAGAGCCC	GTAGAAAAGA	TCAAAGGATC	TTCTTGAGAT
1801	CCTTTTTTTC	TGCGCGTAAT	CTGCTGCTTG	CAAACAAAAA	AACCACCGCT	ACCAGCGGTG
1861	GTTTGTTTGC	CGGATCAAGA	GCTACCAACT	CTTTTCCGA	AGGTAACCTG	CTTCAGCAGA
1921	GCGCAGATAC	CAAATACTGT	TCTTCTAGTG	TAGCCGTAGT	TAGGCCACCA	CTTCAAGAAC
1981	TCTGTAGCAC	CGCCTACATA	CCTCGCTCTG	CTAATCCTGT	TACCAGTGGC	TGCTGCCAGT
2041	GGCGATAAGT	CGTGTCTTAC	CGGGTTGGAC	TCAAGACGAT	AGTTACCGGA	TAAGGCGCAG
2101	CGGTCGGGCT	GAACGGGGGG	TTCGTGCACA	CAGCCCAGCT	TGGAGCGAAC	GACCTACACC
2161	GAAGTGAAGT	ACCTACAGCG	TGAGCTATGA	GAAAGCGCCA	CGCTTCCCGA	AGGGAGAAAG
2221	GCGGACAGGT	ATCCGGTAAG	CGGCAGGGTC	GGAACAGGAG	AGCGCACGAG	GGAGCTTCCA
2281	GGGGGAAACG	CCTGGTATCT	TTATAGTCCT	GTCGGGTTTC	GCCACCTCTG	ACTTGAGCGT
2341	CGATTTTTGT	GATGCTCGTC	AGGGGGGCGG	AGCCTATGGA	AAAACGCCAG	CAACGCGGCC
2401	TTTTTACGGT	TCCTGGCCTT	TTGCTGGCCT	TTTGCTCACA	TGTTCTTTCC	TGCGTTATCC
2461	CCTGATTCTG	TGGATAACCG	TATTACCGCT	AGCATGGATC	TCGGGGACGT	CTAACTACTA
2521	AGCGAGAGTA	GGGAACTGCC	AGGCATCAAA	TAAACGAAA	GGCTCAGTCG	GAAGACTGGG
2581	CCTTTTCGTT	TATCTGTTGT	TTGTCGGTGA	ACGCTCTCCT	GAGTAGGACA	AATCCGCCGG
2641	GAGCGGATTT	GAACGTTGTG	AAGCAACGGC	CCGGAGGGTG	GCGGGCAGGA	CGCCCGCCAT
2701	AAACTGCCAG	GCATCAAACCT	AAGCAGAAGG	CCATC		

FIG.17B

CLONING SITES OF THE ENTRY VECTOR pENTR9

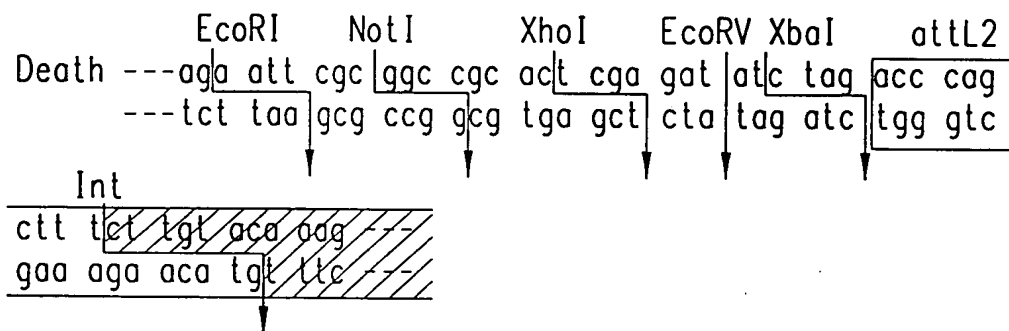
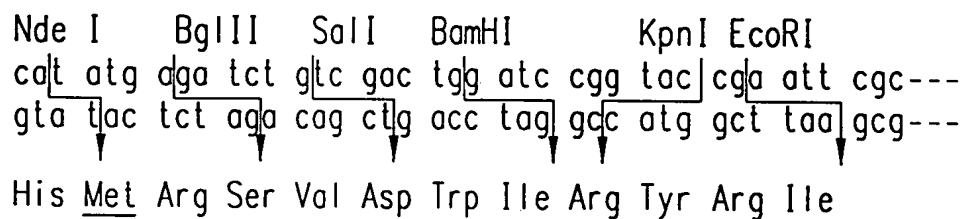
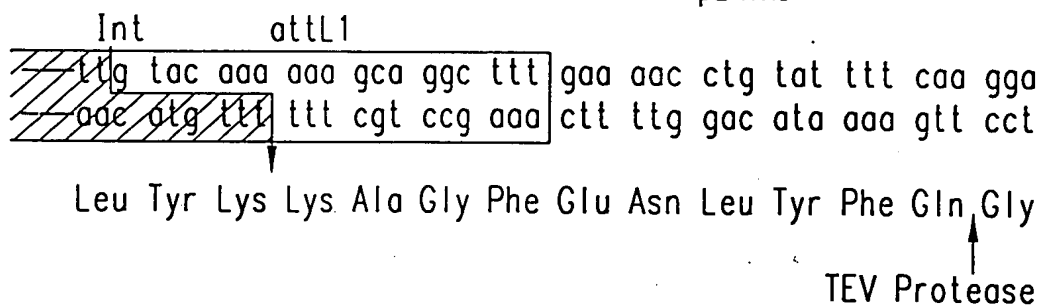


FIG.18A

27/253

pENTR9 2735 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
339..644	ccdB
673..772	attL2
895..1704	KmR
1809..2382	ori

1	CTGACGGATG	GCCTTTTTGC	GTTTCTACAA	ACTCTTCCTG	TTAGTTAGTT	ACTTAAGCTC
61	GGGCCCCAAA	TAATGATTTT	ATTTTGACTG	ATAGTGACCT	GTTTCGTTGCA	ACAAATTGAT
121	AAGCAATGCT	TTTTTATAAT	GCCAACTTTG	TACAAAAAAG	CAGGCTTTGA	AAACCTGTAT
181	TTTCAAGGAC	ATATGAGATC	TGTCGACTGG	ATCCGGTACC	GAATTCGCTT	ACTAAAAGCC
241	AGATAACAGT	ATGCGTATTT	GCGCGCTGAT	TTTTGCGGTA	TAAGAATATA	TACTGATATG
301	TATACCCGAA	GTATGTCAAA	AAGAGGTGTG	CTTCTAGAAT	GCAGTTTAAG	GTTTACACCT
361	ATAAAAGAGA	GAGCCGTTAT	CGTCTGTTTG	TGGATGTACA	GAGTGATATT	ATTGACACGC
421	CCGGGCGACG	GATAGTGATC	CCCCTGGCCA	GTGCACGTCT	GCTGTCAGAT	AAAGTCTCCC
481	GTGAACTTTA	CCCGGTGGTG	CATATCGGGG	ATGAAAGCTG	GCGCATGATG	ACCACCGATA
541	TGGCCAGTGT	GCCGGTCTCC	GTTATCGGGG	AAGAAGTGGC	TGATCTCAGC	CACCGCGAAA
601	ATGACATCAA	AAACGCCATT	AACCTGATGT	TCTGGGGAAT	ATAGAATTCTG	CGGCCGCACT
661	CGAGATATCT	AGACCCAGCT	TTCTTGTACA	AAGTTGGCAT	TATAAGAAAG	CATTGCTTAT
721	CAATTTGTTG	CAACGAACAG	GCTACTATCA	GTCAAAATAA	AATCATTATT	TGCCATCCAG
781	CTGCAGCTCT	GGCCCGTGTC	TCAAAATCTC	TGATGTTACA	TTGCACAAGA	TAAAAATATA
841	TCATCATGAA	CAATAAAACT	GTCTGCTTAC	ATAAACAGTA	ATACAAGGGG	TGTTATGAGC
901	CATATTCAAC	GGGAAACGTC	GAGGCCGCGA	TTAAATTCCA	ACATGGATGC	TGATTTATAT
961	GGGTATAAAT	GGGCTCGCGA	TAATGTCGGG	CAATCAGGTG	CGACAATCTA	TCGCTTGTAT
1021	GGGAAGCCCG	ATGCGCCAGA	GTTGTTTCTG	AAACATGGCA	AAGGTAGCGT	TGCCAATGAT
1081	GTTACAGATG	AGATGGTCAG	ACTAACTGG	CTGACGGAAT	TTATGCCTCT	TCCGACCATC
1141	AAGCATTTTA	TCCGTACTCC	TGATGATGCA	TGGTTACTCA	CCACTGCGAT	CCCCGGAAAA
1201	ACAGCATTCC	AGGTATTAGA	AGAATATCCT	GATTCAGGTG	AAAATATTGT	TGATGCGCTG
1261	GCAGTGTCCC	TGCGCCGGTT	GCATTTCGATT	CCTGTTTGTA	ATTGTCCTTT	TAACAGCGAT
1321	CGCGTATTTT	GTCTCGCTCA	GGCGCAATCA	CGAATGAATA	ACGGTTTGGT	TGATGCGAGT
1381	GATTTTGATG	ACGAGCGTAA	TGGCTGGCCT	GTTGAACAAG	TCTGGAAAGA	AATGCATAAA
1441	CTTTTGCCAT	TCTCACCGGA	TTCAGTCGTC	ACTCATGGTG	ATTTCTCACT	TGATAACCTT
1501	ATTTTGTACG	AGGGGAAATT	AATAGGTTGT	ATTGATGTTG	GACGAGTCGG	AATCGCAGAC
1561	CGATACGAGG	ATCTTGCCAT	CCTATTGGAAC	TGCCTCGGTG	AGTTTTCTCC	TTCATTACAG
1621	AAACGCGCTT	TTCAAAAATA	TGGTATTGAT	AATCCTGATA	TGAATAAATT	GCAGTTTCAT
1681	TTGATGCTCG	ATGAGTTTTT	CTAATCAGAA	TTGGTTAATT	GGTTGTAACA	TTATTTCAGT
1741	TGGGCCCCGT	TCCACTGAGC	GTCAGACCCC	GTAGAAAAGA	TCAAAGGATC	TTCTTGAGAT
1801	CCTTTTTTTC	TGCGCGTAAT	CTGCTGCTTG	CAAACAAAAA	AACCACCGCT	ACCAGCGGTG
1861	GTTTGTTTGC	CGGATCAAGA	GCTACCAACT	CTTTTTCCGA	AGGTAACCTG	CTTCAGCAGA
1921	GCGCAGATAC	CAAATACTGT	TCTTCTAGTG	TAGCCGTAGT	TAGGCCACCA	CTTCAAGAAC
1981	TCTGTAGCAC	CGCCTACATA	CCTCGCTCTG	CTAATCCTGT	TACCAGTGGC	TGCTGCCAGT
2041	GCGGATAAGT	CGTGTCTTAC	CGGGTTGGAC	TCAAGACGAT	AGTTACCGGA	TAAGGCGCAG
2101	CGGTCGGGCT	GAACGGGGGG	TTCGTGCACA	CAGCCCAGCT	TGGAGCGAAC	GACCTACACC
2161	GAAGTGAAGT	ACCTACAGCG	TGAGCTATGA	GAAAGCGCCA	CGCTTCCCAG	AGGGAGAAAG
2221	GCGGACAGGT	ATCCGGTAAG	CGGCAGGGTC	GGAACAGGAG	AGCGCACGAG	GGAGCTTCCA
2281	GGGGGAAACG	CCTGGTATCT	TTATAGTCCT	GTCGGGTTTC	GCCACCTCTG	ACTTGAGCGT
2341	CGATTTTGTG	GATGCTCGTC	AGGGGGGCGG	AGCCTATGGA	AAAACGCCAG	CAACGCGGCC
2401	TTTTTACGGT	TCCTGGCCTT	TTGCTGGCCT	TTTGCTCACA	TGTTCTTTCC	TGCGTTATCC
2461	CCTGATTCTG	TGGATAACCG	TATTACCGCT	AGCATGGATC	TCGGGGAGTC	CTAACTACTA
2521	AGCGAGAGTA	GGGAAC TGCC	AGGCATCAAA	TAAACGAAA	GGCTCAGTCG	GAAGACTGGG
2581	CCTTTCGTTT	TATCTGTTGT	TTGTCGGTGA	ACGCTCTCCT	GAGTAGGACA	AATCCGCCGG
2641	GAGCGGATTT	GAACGTTGTG	AAGCAACGGC	CCGGAGGGTG	GCGGGCAGGA	CGCCCGCCAT
2701	AAACTGCCAG	GCATCAAAC	AAGCAGAAGG	CCATC		

FIG.18B

CLONING SITES OF THE ENTRY VECTOR pENTR10

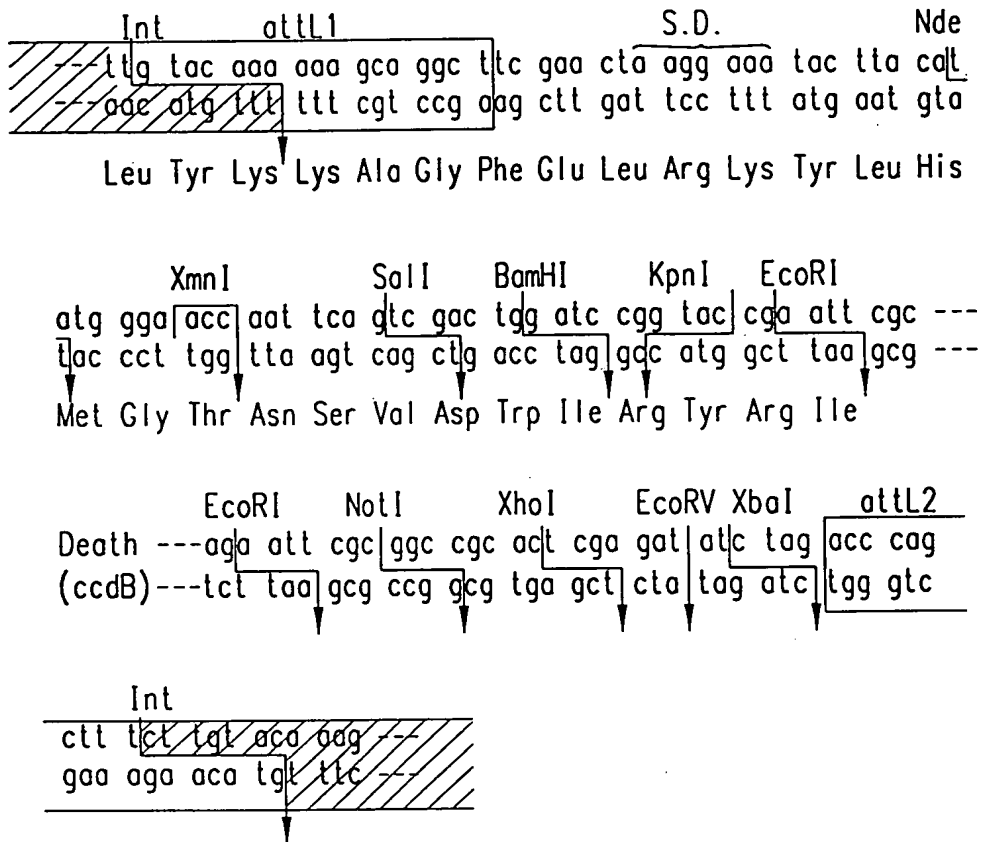


FIG.19A

29/253

pENTR10 2738 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
342..647	ccdB
676..775	attL2
898..1707	KmR
1812..2385	ori

1	CTGACGGATG	GCCTTTTTGC	GTTTCTACAA	ACTCTTCCTG	TTAGTTAGTT	ACTTAAGCTC
61	GGGCCCCAAA	TAATGATTTT	ATTTTGACTG	ATAGTGACCT	GTTCGTTGCA	ACAAATTGAT
121	AAGCAATGCT	TTTTTATAAT	GCCAACTTTG	TACAAAAAAG	CAGGCTTCGA	ACTAAGGAAA
181	TACTTACATA	TGGGAACCAA	TTCACTCGAC	TGGATCCGGT	ACCGAATTCG	CTTACTAAAA
241	GCCAGATAAC	AGTATGCGTA	TTTGC GCGCT	GATTTTTGCG	GTATAAGAAT	ATATACTGAT
301	ATGTATACCC	GAAGTATGTC	AAAAAGAGGT	GTGCTTCTAG	AATGCAGTTT	AAGGTTTACA
361	CCTATAAAAG	AGAGAGCCGT	TATCGTCTGT	TTGTGGATGT	ACAGAGTGAT	ATTATTGACA
421	CGCCCGGGCG	ACGGATGGTG	ATCCCCCTGG	CCAGTGCACG	TCTGCTGTCA	GATAAAGTCT
481	CCCGTGAAC	TTACCCGGTG	GTGCATATCG	GGGATGAAAG	CTGGCGCATG	ATGACCACCG
541	ATATGGCCAG	TGTGCCGGTC	TCCGTTATCG	GGGAAGAAGT	GGCTGATCTC	AGCCACCGCG
601	AAAATGACAT	CAAAAACGCC	ATTAACCTGA	TGTTCTGGGG	AATATAGAAT	TCGCGGCCGC
661	ACTCGAGATA	TCTAGACCCA	GCTTTCTTGT	ACAAAGTTGG	CATTATAAGA	AAGCATTGCT
721	TATCAATTTG	TTGCAACGAA	CAGGTCAC	TCAGTCAAAA	TAAAATCATT	ATTTGCCATC
781	CAGCTGCAGC	TCTGGCCCGT	GTCTCAAAAT	CTCTGATGTT	ACATTGCACA	AGATAAAAAAT
841	ATATCATCAT	GAACAATAAA	ACTGTCTGCT	TACATAAACA	GTAATACAAG	GGGTGTTATG
901	AGCCATATTC	AACGGGAAAC	GTCGAGGCCG	CGATTAAATT	CCAACATGGA	TGCTGATTTA
961	TATGGGTATA	AATGGGCTCG	CGATAATGTC	GGGCAATCAG	GTGCGACAAT	CTATCGCTTG
1021	TATGGGAAGC	CCGATGCGCC	AGAGTTGTTT	CTGAAACATG	GCAAAGGTAG	CGTTGCCAAT
1081	GATGTTACAG	ATGAGATGGT	CAGACTAAAC	TGGCTGACGG	AATTTATGCC	TCTTCCGACC
1141	ATCAAGCATT	TTATCCGTAC	TCCTGATGAT	GCATGGTTAC	TCACCACTGC	GATCCCCGGA
1201	AAAACAGCAT	TCCAGGTATT	AGAAGAATAT	CCTGATTCAG	GTGAAAATAT	TGTTGATGCG
1261	CTGGCAGTGT	TCCTGCGCCG	GTTGCATTCT	ATTCTGTGTT	GTAATTGTCC	TTTTAACAGC
1321	GATCGCGTAT	TTCTGCTCGC	TCAGGCGCAA	TCACGAATGA	ATAACGGTTT	GGTTGATGCG
1381	AGTGATTTTG	ATGACGAGCG	TAATGGCTGG	CCTGTTGAAC	AAGTCTGGAA	AGAAATGCAT
1441	AAACTTTTTG	CATTCTCACC	GGATTCACTG	GTCACCTCATG	GTGATTTCTC	ACTTGATAAC
1501	CTTATTTTTG	ACGAGGGGAA	ATTAATAGGT	TGTATTGATG	TTGGACGAGT	CGGAATCGCA
1561	GACCGATACC	AGGATCTTGC	CATCCTATGG	AACCTGCCTCG	GTGAGTTTTT	TCCTTCATTA
1621	CAGAAACGGC	TTTTTCAAAA	ATATGGTATT	GATAATCCTG	ATATGAATAA	ATTGCAGTTT
1681	CATTTGATGC	TCGATGAGTT	TTTCTAATCA	GAATTGGTTA	ATTGGTTGTA	ACATTATTCA
1741	GATTTGGGCC	CGTTCCACTG	AGCGTCAGAC	CCCGTAGAAA	AGATCAAAGG	ATCTTCTTGA
1801	GATCCTTTTT	TTCTGCGCGT	AATCTGCTGC	TTGCAAACAA	AAAAACCACC	GCTACCAGCG
1861	GTGGTTTGTT	TGCCGGATCA	AGAGCTACCA	ACTCTTTTTT	CGAAGGTAAC	TGGCTTCAGC
1921	AGAGCGCAGA	TACCAAATAC	TGTTCTTCTA	GTGTAGCCGT	AGTTAGGCCA	CCACTTCAAG
1981	AACTCTGTAG	CACCGCCTAC	ATACCTCGCT	CTGCTAATCC	TGTTACCAGT	GGCTGCTGCC
2041	AGTGGCGATA	AGTCGTGTCT	TACCGGGTTG	GACTCAAGAC	GATAGTTACC	GGATAAGGCG
2101	CAGCGGTCGG	GCTGAACGGG	GGGTTTCGTG	ACACAGCCCA	GCTTGGAGCG	AACGACCTAC
2161	ACCGAACTGA	GATACCTACA	GCGTGAGCTA	TGAGAAAGCG	CCACGCTTCC	CGAAGGGAGA
2221	AAGGCGGACA	GGTATCCGGT	AAGCGGCAGG	GTCGGAACAG	GAGAGCGCAC	GAGGGAGCTT
2281	CCAGGGGGAA	ACGCCTGGTA	TCTTTATAGT	CCTGTCGGGT	TTCGCCACCT	CTGACTTGAG
2341	CGTCGATTTT	TGTGATGCTC	GTCAGGGGGG	CGGAGCCTAT	GGAAAAACGC	CAGCAACGCG
2401	GCCTTTTTTAC	GGTTCCTGGC	CTTTTGCTGG	CCTTTTGCTC	ACATGTTCTT	TCCTGCGTTA
2461	TCCCCTGATT	CTGTGGATAA	CCGTATTACC	GCTAGCATGG	ATCTCGGGGA	CGTCTAAGTA
2521	CTAAGCGAGA	GTAGGGAATC	GCCAGGCATC	GAATAAAACG	AAAGGCTCAG	TCGGAAGACT
2581	GGGCCTTTTCG	TTTTATCTGT	TGTTTGCTCG	TGAACGCTCT	CCTGAGTAGG	ACAAATCCGC
2641	CGGGAGCGGA	TTTGAACGTT	GTGAAGCAAC	GGCCCGGAGG	GTGGCGGGCA	GGACGCCCGC
2701	CATAAACTGC	CAGGCATCAA	ACTAAGCAGA	AGGCCATC		

FIG.19B

CLONING SITES OF THE ENTRY VECTOR pENTR11

Int	attL1		S.D.	Kozak	XmnI		S.D.										
TTG	TAC	AAA	AAA	GCA	GGC	TTT	GAA	GGA	GAT	AGA	ACC	AAT	TCT	CTA	AGG	AAA	TAC
AAC	ATG	TTT	TTT	CGT	CCG	AAG	CTT	CCT	CTA	TCT	TGG	TTA	AGA	GAT	TCC	TTT	ATG
Leu	Tyr	Lys	Lys	Ala	Gly	Phe	Glu	Gly	Asp	Arg	Thr	Asn	Ser	Leu	Arg	Lys	Tyr

Kozak	NcoI	SalI	BamHI	KpnI	EcoRI		EcoRI	NotI												
TTA	ACC	ATG	GTC	GAC	TGG	ATC	CCG	TAC	CGA	ATT	C	--	ccdB	--	G	AAT	TCG	CGG	CCG	
AAT	TGG	TAC	CAG	CTG	ACC	TAG	GCC	ATG	GCT	TAA	G					C	TTA	AGC	GCC	GGC
Leu	Thr	Met	Val	Asp	Trp	Ile	Arg	Tyr	Arg	Ile						Asn	Ser	Arg	Pro	

XhoI	EcoRV	XbaI		Int	attL2							
CAC	TCG	AGA	TAT	CTA	GAC	CCA	GCT	TTT	TTG	TAC	AAA	G
GTG	AGC	TCT	ATA	GAT	CTG	GGT	CGA	AAG	AAC	ATG	TTT	C
His	Ser	Arg	Tyr	Leu	Asp	Pro	Ala	Phe	Leu	Tyr	Lys	

FIG.20A

31/253

pENTR11 2744 bp (rotated to position 2578)

Location (Base Nos.)	Gene Encoded
67..166	attL1
348..653	ccdB
683..781	attL2
904..1713	KmR
1818..2391	ori

1	CTGACGGATG	GCCTTTTTGC	GTTTCTACAA	ACTCTTCCTG	TTAGTTAGTT	ACTTAAGCTC
61	GGGCCCCAAA	TAATGATTTT	ATTTTGACTG	ATAGTGACCT	GTTCGTTGCA	ACAAATTGAT
121	AAGCAATGCT	TTTTTATAAT	GCCAACTTTG	TACAAAAAAG	CAGGCTTCGA	AGGAGATAGA
181	ACCAATTCTC	TAAGGAAATA	CTTAACCATG	GTCGACTGGA	TCCGGTACCG	AATTCGCTTA
241	CTAAAAGCCA	GATAACAGTA	TGCGTATTTG	CGCGCTGATT	TTTGCGGTAT	AAGAATATAT
301	ACTGATATGT	ATACCCGAAG	TATGTCAAAA	AGAGGTGTGC	TTCTAGAATG	CAGTTTAAAGG
361	TTTACACCTA	TAAAAGAGAG	AGCCGTTATC	GTCTGTTTGT	GGATGTACAG	AGTGATATTA
421	TTGACACGCC	CGGGCGACGG	ATAGTGATCC	CCCTGGCCAG	TGCACGTCTG	CTGTCAGATA
481	AAGTCTCCCG	TGAACTTTAC	CCGGTGGTGC	ATATCGGGGA	TGAAAGCTGG	CGCATGATGA
541	CCACCGATAT	GGCCAGTGTG	CCGGTCTCCG	TTATCGGGGA	AGAAGTGGCT	GATCTCAGCC
601	ACCGCGAAAA	TGACATCAAA	AACGCCATTA	ACCTGATGTT	CTGGGGAATA	TAGAATTTCG
661	GGCCGCACTC	GAGATATCTA	GACCCAGCTT	TCTTGTACAA	AGTTGGCATT	ATAAGAAAGC
721	ATTGCTTATC	AATTTGTTGC	AACGAACAGG	TCACTATCAG	TCAAATAAAA	ATCATTATTT
781	GCCATCCAGC	TGCAGCTCTG	GCCCGTGTCT	CAAAATCTCT	GATGTTACAT	TGCACAAGAT
841	AAAAATATAT	CATCATGAAC	AATAAAACTG	TCTGCTTACA	TAAACAGTAA	TACAAGGGGT
901	GTTATGAGCC	ATATTCAACG	GGAAACGTCG	AGGCCGCGAT	TAAATTCCAA	CATGGATGCT
961	GATTTATATG	GGTATAAATG	GGCTCGCGAT	AATGTCGGGC	AATCAGGTGC	GACAATCTAT
1021	CGCTTGTATG	GGAAGCCCGA	TGCGCCAGAG	TTGTTTCTGA	AACATGGCAA	AGGTAGCGTT
1081	GCCAATGATG	TTACAGATGA	GATGGTCAGA	CTAAACTGGC	TGACGGAATT	TATGCCTCTT
1141	CCGACCATCA	AGCATTTTAT	CCGTACTCCT	GATGATGCAT	GGTTACTCAC	CACTGCGATC
1201	CCCGGAAAAA	CAGCATTCCA	GGTATTAGAA	GAATATCCTG	ATTCAGGTGA	AAATATTGTT
1261	GATGCGCTGG	CAGTGTTCTT	GCGCCGGTTG	CATTCGATTG	CTGTTTGTA	TTGTCTTTT
1321	AACAGCGATC	GCGTATTTCT	TCTCGCTCAG	GCGCAATCAC	GAATGAATAA	CGGTTTGTT
1381	GATGCGAGTG	ATTTTGATGA	CGAGCGTAAT	GGCTGGCCTG	TTGAACAAGT	CTGGAAAGAA
1441	ATGCATAAAC	TTTTGCCATT	CTCACC GGAT	TCAGTCGTCA	CTCATGGTGA	TTTCTCACTT
1501	GATAACCTTA	TTTTTGACGA	GGGGAAATTA	ATAGGTTGTA	TTGATGTTGG	ACGAGTCGGA
1561	ATCGCAGACC	GATACCAGGA	TCTTGCCATC	CTATGGAAC	GCCTCGGTGA	GTTTTCTCCT
1621	TCATTACAGA	AACGGCTTTT	TCAAAAATAT	GGTATTGATA	ATCCTGATAT	GAATAAATTG
1681	CAGTTTCATT	TGATGCTCGA	TGAGTTTTC	TAATCAGAAT	TGGTTAATTG	GTTGTAACAT
1741	TATTTCAGATT	GGGCCCGGTT	CCAGTGAGCG	TCAGACCCCG	TAGAAAAGAT	CAAAGGATCT
1801	TCTTGAGATC	CTTTTTTCT	GCGCGTAATC	TGCTGCTTGC	AAACAAAAAA	ACCACCGCTA
1861	CCAGCGGTGG	TTTGTTTGCC	GGATCAAGAG	CTACCAACTC	TTTTTCCGAA	GGTAACTGGC
1921	TTCAGCAGAG	CGCAGATACC	AAATACTGTT	CTTCTAGTGT	AGCCGTAGTT	AGGCCACCAC
1981	TTCAAGAACT	CTGTAGCACC	GCCTACATAC	CTCGCTCTGC	TAATCCTGTT	ACCAAGTGGCT
2041	GCTGCCAGTG	GCGATAAGTC	GTGTCTTACC	GGGTTGGACT	CAAGACGATA	GTTACCGGAT
2101	AAGGCGCAGC	GGTCGGGCTG	AACGGGGGGT	TCGTGCACAC	AGCCCAGCTT	GGAGCGAACG
2161	ACCTACACCG	AACTGAGATA	CCTACAGCGT	GAGCTATGAG	AAAGCGCCAC	GCTTCCCGAA
2221	GGGAGAAAGG	CGGACAGGTA	TCCGGTAAGC	GGCAGGGTCG	GAACAGGAGA	GCGCACGAGG
2281	GAGCTTCCAG	GGGGAAACGC	CTGGTATCTT	TATAGTCCTG	TCGGGTTTCG	CCACCTCTGA
2341	CTTGAGCGTC	GATTTTTGTG	ATGCTCGTCA	GGGGGGCGGA	GCCTATGGAA	AAACGCCAGC
2401	AACGCGGCCT	TTTTACGGTT	CCTGGCCTTT	TGCTGGCCTT	TTGCTCACAT	GTTCTTTTCT
2461	GCGTTATCCC	CTGATTCTGT	GGATAACCGT	ATTACCGCTA	GCATGGATCT	CGGGGACGTC
2521	TAACTACTAA	GCGAGAGTAG	GGAAGTGCCA	GGCATCAAAT	AAAACGAAAG	GCTCAGTCGG
2581	AAAGCTGGGC	CTTTCGTTTT	ATCTGTTGTT	TGTCGGTGAA	CGCTCTCCTG	AGTAGGACAA
2641	ATCCGCCGGG	AGCGGATTTG	AACGTTGTGA	AGCAACGGCC	CGGAGGGTGG	CGGGCAGGAC
2701	GCCCGCCATA	AACTGCCAGG	CATCAAATA	AGCAGAAGGC	CATC	

FIG.20B

NATIVE PROTEIN EXPRESSION IN E. COLI

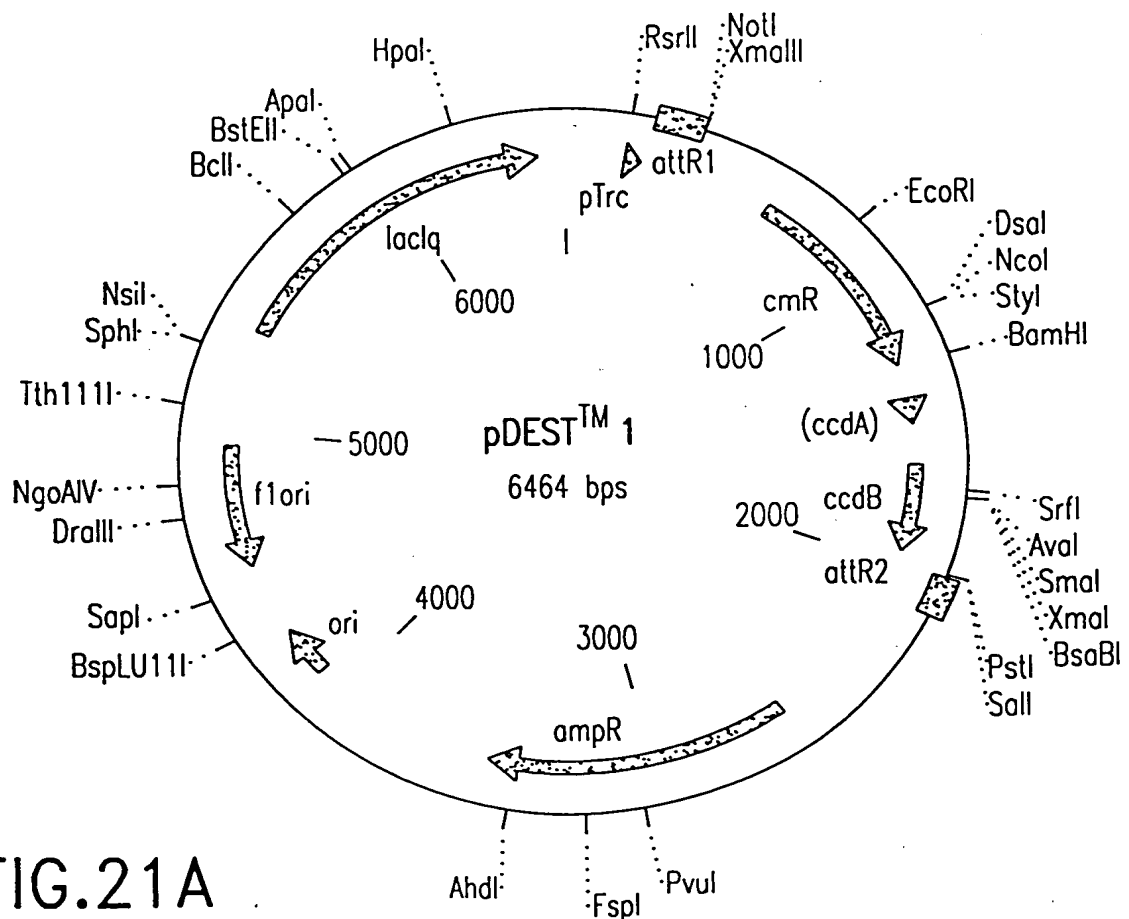
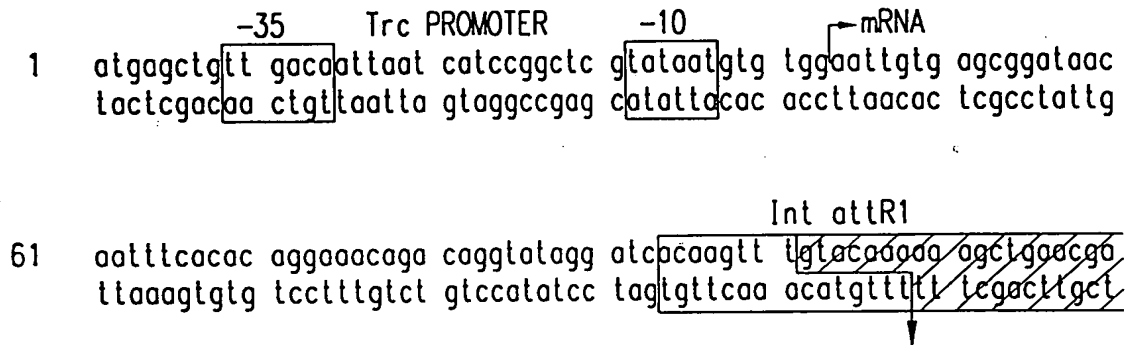


FIG.21A

33/253

pDEST1 6464 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
216..257	Trc promoter
397..273	attR1
647..1306	CmR
1426..1510	inactivated ccdA
1648..1953	ccdB
1994..2118	attR2
2598..3503	ampR
4104..4264	ori
4504..4941	flori (f1 intergenic region)
5340..6420	lacIq

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1  GTTTGACAGC TTATCATCGA CTGCACGGTG CACCAATGCT TCTGGCGTCA GGCAGCCATC
61 GGAAGCTGTG GTATGGCTGT GCAGGTCGTA AATCACTGCA TAATTCGTGT CGCTCAAGGC
121 GCACTCCCGT TCTGGATAAT GTTTTTTGCG CCGACATCAT AACGGTTCTG GCAAATATTC
181 TGAAATGAGC TGTTGACAAT TAATCATCCG GTCCGTATAA TCTGTGGAAT TGTGAGCGGG
241 ATAACAATTT CATCGCGAGG TACCAAGCTA TCACAAGTTT GTACAAAAAA GCTGAACGAG
301 AAACGTAAAA TGATATAAAT ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA
361 CATAATACTG TAAAACACAA CATATCCAGT CACTATGGCG GCCGCTAAGT TGGCAGCATC
421 ACCCGACGCA CTTTGCGCCG AATAAATACC TGTGACGGAA GATCACTTCG CAGAATAAAT
481 AAATCCTGGT GTCCCTGTTG ATACCGGGAA GCCCTGGGCC AACTTTTGGC GAAAATGAGA
541 CGTTGATCGG CACGTAAGAG GTTCCAATT TCACCATAAT GAAATAAGAT CACTACCGGG
601 CGTATTTTTT GAGTTATCGA GATTTTCAGG AGCTAAGGAA GCTAAAATGG AGAAAAAAT
661 CACTGGATAT ACCACCGTTG ATATATCCCA ATGGCATCGT AAAGAACATT TTGAGGCATT
721 TCAGTCAGTT GCTCAATGTA CCTATAACCA GACCGTTCAG CTGGATATTA CGGCCTTTTT
781 AAAGACCGTA AAGAAAAATA AGCACAAGTT TTATCCGGCC TTTATTCACA TTCTTGCCCG
841 CCTGATGAAT GTCATCCGG AATTCCGTAT GGCAATGAAA GACGGTGAGC TGGTGATATG
901 GGATAGTGTT CACCCTTGTT ACACCGTTTT CCATGAGCAA ACTGAAACGT TTTTCATCGCT
961 CTGGAGTGAA TACCACGACG ATTTCCGGCA GTTTCTACAC ATATATTCGC AAGATGTGGC
1021 GTGTTACGGT GAAAACCTGG CCTATTTCCC TAAAGGGTTT ATTGAGAATA TGTTTTTCGT
1081 CTCAGCCAAT CCCTGGGTGA GTTTCACCAG TTTTGATTTA AACGTGGCCA ATATGGACAA
1141 CTTCTTCGCC CCCGTTTTCA CCATGGGCAA ATATTATACG CAAGGCGACA AGGTGCTGAT
1201 GCCGCTGGCG ATTCAGGTTT ATCATGCCGT CTGTGATGGC TTCCATGTCG GCAGAATGCT
1261 TAATGAATTA CAACAGTACT GCGATGAGTG GCAGGGCGGG GCGTAAACGC GTGGATCCGG
1321 CTTACTAAAA GCCAGATAAC AGTATGCGTA TTTGCGCGCT GATTTTTGCG GTATAAGAAT
1381 ATATACTGAT ATGTATACCC GAAGTATGTC AAAAAGAGGT GTGCTATGAA GCAGCGTATT
1441 ACAGTGACAG TTGACAGCGA CAGCTATCAG TTGCTCAAGG CATATATGAT GTCAATATCT
1501 CCGGTCTGGT AAGCACAACC ATGCAGAATG AAGCCCGTCG TCTGCGTGCC GAACGCTGGA
1561 AAGCGGAAAA TCAGGAAGGG ATGGCTGAGG TCGCCCGGTT TATTGAAATG AACGGCTCTT
1621 TTGCTGACGA GAACAGGGAC TGGTGAAATG CAGTTTAAGG TTTACACCTA TAAAAGAGAG
1681 AGCCGTTATC GTCTGTTTGT GGATGTACAG AGTGATATTA TTGACACGCC CGGGCGACGG

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FIG.21B

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1741 ATGGTGATCC CCCTGGCCAG TGCACGTCTG CTGTCAGATA AAGTCTCCCG TGAAC TTTAC
1801 CCGGTGGTGC ATATCGGGGA TGAAAGCTGG CGCATGATGA CCACCGATAT GGCCAGTGTG
1861 CCGGTCTCCG TTATCGGGGA AGAAGTGGCT GATCTCAGCC ACCGCGAAAA TGACATCAAA
1921 AACGCCATTA ACCTGATGTT CTGGGGAATA TAAATGTCAG GCTCCCTTAT ACACAGCCAG
1981 TCTGCAGGTC GACCATAGTG ACTGGATATG TTGTGTTTTA CAGTATTATG TAGTCTGTTT
2041 TTTATGCAAA ATCTAATTTA ATATATTGAT ATTTATATCA TTTTACGTTT CTCGTTCAGC
2101 TTTCTTGTAC AAAGTGGTGA TAGCTTGGCT GTTTTGGCGG ATGAGAGAAG ATTTTCAGCC
2161 TGATACAGAT TAAATCAGAA CGCAGAAGCG GTCTGATAAA ACAGAATTTG CCTGGCGGCA
2221 GTAGCGCGGT GGTCCACCT GACCCCATGC CGAACTCAGA AGTGAAACGC CGTAGCGCCG
2281 ATGGTAGTGT GGGGTCTCCC CATGCGAGAG TAGGGAAGTG CCAGGCATCA AATAAAACGA
2341 AAGGCTCAGT CGAAAGACTG GGCTTTTCGT TTTATCTGTT GTTTGTCGGT GAACGCTCTC
2401 CTGAGTAGGA CAAATCCGCC GGGAGCGGAT TTGAACGTTG CGAAGCAACG GCCCGGAGGG
2461 TGGCGGGCAG GACGCCCGCC ATAAACTGCC AGGCATCAAA TTAAGCAGAA GGCCATCCTG
2521 ACGGATGGCC TTTTTCGCTT TCTACAACT CTTTTTGTTT ATTTTTCTAA ATACATTCAA
2581 ATATGTATCC GCTCATGAGA CAATAACCCT GATAAATGCT TCAATAATAT TGAAAAAGGA
2641 AGAGTATGAG TATTCAACAT TTCCGTGTCG CCCTTATTCC CTTTTTTCG GCATTTTGCC
2701 TTCCTGTTTT TGCTACCCA GAAACGCTGG TGAAAGTAAA AGATGCTGAA GATCAGTTGG
2761 GTGCACGAGT GGGTTACATC GAACTGGATC TCAACAGCGG TAAGATCCTT GAGAGTTTTT
2821 GCCCGAAGA ACGTTTTCCA ATGATGAGCA CTTTTAAAGT TCTGCTATGT GGC GCGGTAT
2881 TATCCCGTGT TGACGCCGGG CAAGAGCAAC TCGGTCGCCG CATACTAT TCTCAGAATG
2941 ACTTGGTTGA GTACTACCA GTCACAGAAA AGCATCTTAC GGATGGCATG ACAGTAAGAG
3001 AATTATGCAG TGCTGCCATA ACCATGAGTG ATAACACTGC GGCCAACTTA CTTCTGACAA
3061 CGATCGGAGG ACCGAAGGAG CTAACCGCTT TTTTGCACAA CATGGGGGAT CATGTAAGTC
3121 GCCTTGATCG TTGGGAACCG GAGCTGAATG AAGCCATACC AAACGACGAG CGTGACACCA
3181 CGATGCCTAC AGCAATGGCA ACAACGTTGC GCAAAC TATT AACTGGCGAA CTACTTACTC
3241 TAGCTTCCCG GCAACAATTA ATAGACTGGA TGGAGGCGGA TAAAGTTGCA GGACCACTTC
3301 TGC GCTCGGC CTTCCGGCT GGCTGGTTTA TTGCTGATAA ATCTGGAGCC GGTGAGCGTG
3361 GGTCTCGCGG TATCATTGCA GCACTGGGGC CAGATGGTAA GCCCTCCCGT ATCGTAGTTA
3421 TCTACACGAC GGGGAGTCAG GCAACTATGG ATGAACGAAA TAGACAGATC GCTGAGATAG
3481 GTGCCTCACT GATTAAGCAT TGGTAACTGT CAGACCAAGT TTA CT CATAT AACTTTAGA
3541 TTGATTTAAA ACTTCATTTT TAATTTAAAA GGATCTAGGT GAAGATCCTT TTTGATAATC
3601 TCATGACCAA AATCCCTTAA CGTGAGTTTT CGTTCCACTG AGCGTCAGAC CCCGTAGAAA
3661 AGATCAAAGG ATCTTCTTGA GATCCTTTTT TTCTGCGCGT AATCTGCTGC TTGCAAACAA
3721 AAAAACCACC GCTACCAGCG GTGGTTTGTG TGCCGGATCA AGAGCTACCA ACTCTTTTTC
3781 CGAAGGTAAC TGGCTTCAGC AGAGCGCAGA TACCAAATAC TGTCCTTCTA GTGTAGCCGT
3841 AGTTAGGCCA CCACTTCAAG AACTCTGTAG CACCGCCTAC ATACCTCGCT CTGCTAATCC
3901 TGTTACCAGT GGCTGCTGCC AGTGGCGATA AGTCGTGTCT TACCGGGTTG GACTCAAGAC
3961 GATAGTTACC GGATAAGGCG CAGCGGTCGG GCTGAACGGG GGGTTCGTGC ACACAGCCCA
4021 GCTTGGAGCG AACGACCTAC ACCGAACTGA GATACCTACA GCGTGAGCTA TGAGAAAGCG
4081 CCACGCTTCC CGAAGGGAGA AAGGCGGACA GGTATCCGGT AAGCGGCAGG GTCGGAACAG
4141 GAGAGCGCAC GAGGGAGCTT CCAGGGGGAA ACGCCTGGTA TCTTTATAGT CCTGTCGGGT

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FIG.21C

4201 TTCGCCACCT CTGACTTGAG CGTCGATTTT TGTGATGCTC GTCAGGGGGG CGGAGCCTAT
 4261 GGAAAAACGC CAGCAACGCG GCCTTTTAC GGTTCCTGGC CTTTGTCTGG CCTTTTGCTC
 4321 ACATGTTCTT TCCTGCGTTA TCCCCTGATT CTGTGGATAA CCGTATTACC GCCTTTGAGT
 4381 GAGCTGATAC CGCTCGCCGC AGCCGAACGA CCGAGCGCAG CGAGTCAGTG AGCGAGGAAG
 4441 CGGAAGAGCG CCTGATGCGG TATTTTCTCC TTACGCATCT GTGCGGTATT TCACACCGCA
 4501 TAATTTTGTT AAAATTCGCG TAAATTTT GTTAAATCAG CTCATTTTTT AACCAATAGG
 4561 CCGAAATCGG CAAAATCCCT TATAAATCAA AAGAATAGAC CGAGATAGGG TTGAGTGTTG
 4621 TTCCAGTTTG GAACAAGAGT CCACTATTAA AGAACGTGGA CTCCAACGTC AAAGGGCGAA
 4681 AAACCGTCTA TCAGGGCGAT GGCCCACTAC GTGAACCATC ACCCTAATCA AGTTTTTTGG
 4741 GGTGAGGTG CCGTAAAGCA CTAAATCGGA ACCCTAAAGG GAGCCCCCGA TTTAGAGCTT
 4801 GACGGGGAAA GCCGGCGAAC GTGGCGAGAA AGGAAGGGAA GAAAGCGAAA GGAGCGGGCG
 4861 CTAGGGCGCT GGCAAGTGTA GCGGTCACGC TGCGCGTAAC CACCACACCC GCCGCGCTTA
 4921 ATGCGCCGCT ACAGGGCGCG TCCATTCGCC ATTCAGGCTG CTATGGTGCA CTCTCAGTAC
 4981 AATCTGCTCT GATGCCGCAT AGTTAAGCCA GTACCAGTCA CGTAGCGATA TCGGAGTGTA
 5041 TACACTCCGC TATCGCTACG TGA CTG GGTG CCG CCGGACACCC GCCAACACCC
 5101 GCTGACGCGC CCTGACGGG TGTCTGCTC CCGGCATCCG CTTACAGACA AGCTGTGACC
 5161 GTCTCCGGGA GCTGCATGTG TCAGAGGTTT TCACCGTCAT CACCGAAACG CGCGAGGCAG
 5221 CAGATCAATT CGCGCGCGAA GCGGAAGCGG CATGCATTTA CGTTGACACC ATCGAATGGT
 5281 GCAAAACCTT TCGCGGTATG GCATGATAGC GCCCGGAAGA GAGTCAATTC AGGGTGGTGA
 5341 ATGTGAAACC AGTAACGTTA TACGATGTCG CAGAGTATGC CGGTGTCTCT TATCAGACCG
 5401 TTTCCCGCGT GGTGAACCAG GCCAGCCACG TTTCTGCGAA AACGCGGGAA AAAGTGGAAG
 5461 CGGCGATGGC GGAGCTGAAT TACATTCCCA ACCGCGTGGC ACAACAACTG GCGGGCAAAC
 5521 AGTCGTTGCT GATTGGCGTT GCCACCTCCA GTCTGGCCCT GCACGCGCCG TCGCAAATTG
 5581 TCGCGGCGAT TAAATCTCGC GCCGATCAAC TGGGTGCCAG CGTGGTGGTG TCGATGGTAG
 5641 AACGAAGCGG CGTCGAAGCC TGTAAGCGG CGGTGCACAA TCTTCTCGCG CAACGCGTCA
 5701 GTGGGCTGAT CATTAACTAT CCGCTGGATG ACCAGGATGC CATTGCTGTG GAAGCTGCCT
 5761 GACTAATGT TCCGGCGTTA TTTCTTGATG TCTCTGACCA GACACCCATC AACAGTATTA
 5821 TTTTCTCCCA TGAAGACGGT ACGCGACTGG GCGTGGAGCA TCTGGTCGCA TTGGGTCACC
 5881 AGCAAATCGC GCTGTTAGCG GGCCCATTA GTTCTGTCTC GGCGCGTCTG CGTCTGGCTG
 5941 GCTGGCATAA ATATCTCACT CGCAATCAA TTCAGCCGAT AGCGGAACGG GAAGGCGACT
 6001 GGAGTGCCAT GTCCGGTTTT CAACAAACCA TGCAAATGCT GAATGAGGGC ATCGTTCCCA
 6061 CTGCGATGCT GGTGCCAAC GATCAGATGG CGCTGGGCGC AATGCGCGCC ATTACCGAGT
 6121 CCGGGCTGCG CGTTGGTGCG GATATCTCGG TAGTGGGATA CGACGATACC GAAGACAGCT
 6181 CATGTTATAT CCCGCCGTTA ACCACCATCA AACAGGATTT TCGCCTGCTG GGGCAAACCA
 6241 GCGTGGACCG CTTGCTGCAA CTCTCTCAGG GCCAGGCGGT GAAGGGCAAT CAGCTGTTGC
 6301 CCGTCTCACT GGTGAAAAGA AAAACCACCC TGGCACCCAA TACGAAACC GCCTCTCCCC
 6361 GCGCGTTGGC CGATTCATTA ATGCAGCTGG CACGACAGGT TTCCCGACTG GAAAGCGGGC
 6421 AGTGAGCGCA ACGCAATTAA TGTGAGTTAG CGCGAATTGA TCTG

FIG.21D

His6 FUSIONS IN E. COLI

970 aat att ctg aaa tga gct gtt gac aat taa tca tcc ggt ccg tat aat ctg
 tta taa gac ttt act cga aaa ctg tta att agt agg cca ggc ata tta gac

-35 Trc PROMOTER -10

1021 tgg aat tgt gag cgg ata aca att tca cac agg aaa cag acc atg tcg tac
 acc tta aca ctc gcc tat tgt taa agt gtg tcc ttt gtc tgg tac agc atg

Met Ser Tyr

1072 Tyr His His His His His His Gly Ile Thr Ser Int attR1
 tac cat cac cat cac cat cac ggc atc aca agt ttg tac aaa aaa gct gaa
 atg gta gtg gta gtg gta gtg ccg tag tgt tca aac atg ttt ttt cga ctt

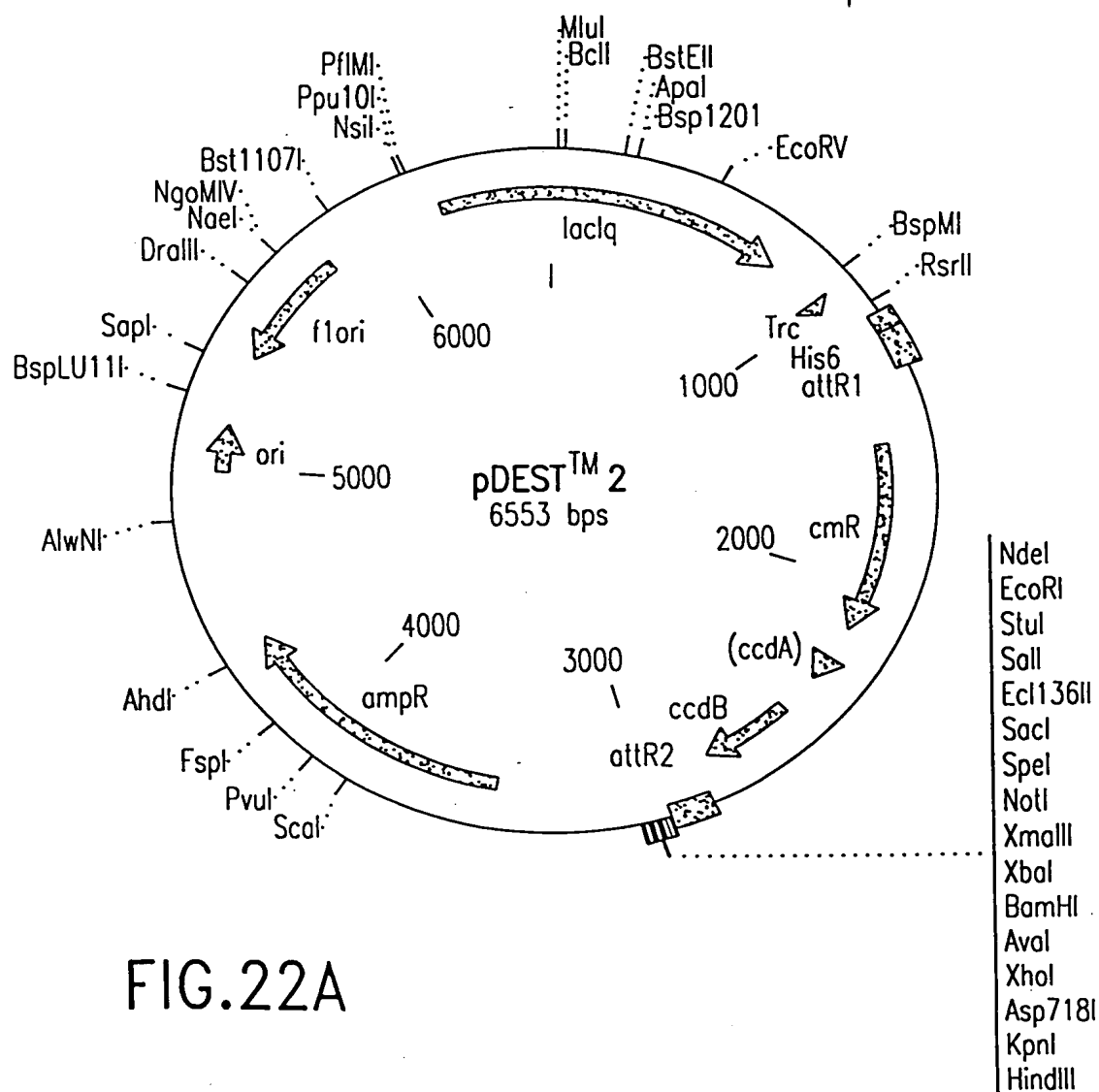


FIG.22A

37/253

pDEST2 6553 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
912..962	Trc
1223..1009	attR1
1473..2132	CmR
2252..2336	inactivated ccdA
2474..2779	ccdB
2820..2944	attR2
3509..4414	ampR
5015..5175	ori
5415..5852	flori (f1 intergenic region)
6225..752	lacIq

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1  GGCGGTGCAC AATCTTCTCG CGCAACGCGT CAGTGGGCTG ATCATTAAC TATCCGCTGGA
61 TGACCAGGAT GCCATTGCTG TGGAAAGCTG CTGCACTAAT GTTCCGGCGT TATTTCTTGA
121 TGTCTCTGAC CAGACACCCA TCAACAGTAT TATTTTCTCC CATGAAGACG GTACGCGACT
181 GGGCGTGGAG CATCTGGTCG CATTGGGTCA CCAGCAAATC GCGCTGTTAG CGGGCCCAT
241 AAGTTCTGTC TCGGCGCGTC TCGCTCTGGC TGGCTGGCAT AAATATCTCA CTCGCAATCA
301 AATTCAGCCG ATAGCGGAAC GGGAAAGGCGA CTGGAGTGCC ATGTCCGGTT TTCAACAAAC
361 CATGCAAATG CTGAATGAGG GCATCGTTCC CACTGCGATG CTGGTTGCCA ACGATCAGAT
421 GGCCTGCGGC GCAATGCGCG CCATTACCGA GTCCGGGCTG CGCGTTGGTG CGGATATCTC
481 GGTAGTGGGA TACGACGATA CCGAAGACAG CTCATGTTAT ATCCCGCCGT CAACCACCAT
541 CAAACAGGAT TTTCGCCTGC TGGGGCAAAC CAGCGTGGAC CGCTTGCTGC AACTCTCTCA
601 GGGCCAGGCG GTGAAGGGCA ATCAGCTGTT GCCCGTCTCA CTGGTGAAAA GAAAAACCAC
661 CCTGGCACCC AATACGCAA CCGCCTCTCC CCGCGCGTTG GCCGATTCAT TAATGCAGCT
721 GGCACGACAG GTTTCCCGAC TGGAAAGCGG GCAGTGAGCG CAACGCAATT AATGTGAGTT
781 AGCGCGAATT GATCTGGTTT GACAGCTTAT CATCGACTGC ACGGTGCACC AATGCTTCTG
841 GCGTCAGGCA GCCATCGGAA GCTGTGGTAT GGCTGTGCAG GTCGTAAATC ACTGCATAAT
901 TCGTGTGCTG CAAGGCGCAC TCCCGTTCTG GATAATGTTT TTTGCGCCGA CATCATAACG
961 GTTCTGGCAA ATATTCTGAA ATGAGCTGTT GACAATTAAT CATCCGGTCC GTATAATCTG
1021 TGGAAATTGTG AGCGGATAAC AATTTACAC AGGAAACAGA CCATGTCGTA CTACCATCAC
1081 CATCACCATC ACGGCATCAC AAGTTTGTAC AAAAAAGCTG AACGAGAAAC GTAAAAATGAT
1141 ATAAATATCA ATATATTTAA TTAGATTTTG CATAAAAAAC AGACTACATA ATACTGTAAA
1201 ACACAACATA TCCAGTCACT ATGGCGGCCG CTAAGTTGGC AGCATACCCC GACGCACTTT
1261 GCGCCGAATA AATACCTGTG ACGGAAGATC ACTTCGCAGA ATAAATAAAT CCTGGTGTCC
1321 CTGTTGATAC CGGGAAGCCC TGGGCCAACT TTTGGCGAAA ATGAGACGTT GATCGGCACG
1381 TAAGAGGTTT CAACTTTCAC CATAATGAAA TAAGATCACT ACCGGGCGTA TTTTTTGAGT
1441 TATCGAGATT TTCAGGAGCT AAGGAAGCTA AAATGGAGAA AAAAATCACT GGATATACCA
1501 CCGTTGATAT ATCCCAATGG CATCGTAAAG AACATTTTGA GGCATTTTCA TCAGTTGCTC
1561 AATGTACCTA TAACCAGACC GTTCAGCTGG ATATTACGGC CTTTTTAAAG ACCGTAAAGA
1621 AAAATAAGCA CAAGTTTTAT CCGGCCTTTA TTCACATTCT TGCCGCGCTG ATGAATGCTC
1681 ATCCGGAATT CCGTATGGCA ATGAAAGACG GTGAGCTGGT GATATGGGAT AGTGTTACAC

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FIG.22B

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1741 CTTGTTACAC CGTTTTCCAT GAGCAAAC TG AAACGTTTTC ATCGCTCTGG AGTGAATACC
1801 ACGACGATTT CCGGCAGTTT CTACACATAT ATTCGCAAGA TGTGGCGTGT TACGGTGAAA
1861 ACCTGGCCTA TTTCCCTAAA GGGTTTATTG AGAATATGTT TTTCGTCTCA GCCAATCCCT
1921 GGGTGAGTTT CACCAGTTTT GATTAAACG TGGCCAATAT GGACAACTTC TTCGCCCCCG
1981 TTTTCACCAT GGGCAAATAT TATACGCAAG GCGACAAGGT GCTGATGCCG CTGGCGATTC
2041 AGGTTTCATCA TGCCGTCTGT GATGGCTTCC ATGTCGGCAG AATGCTTAAT GAATTACAAC
2101 AGTACTGCGA TGAGTGGCAG GCGGGGGCGT AAACGCGTGG ATCCGGCTTA CTAAAAGCCA
2161 GATAACAGTA TGC GTATTG CGCGCTGATT TTTGCGGTAT AAGAATATAT ACTGATATGT
2221 ATACCCGAAG TATGTCAAAA AGAGGTGTGC TATGAAGCAG CGTATTACAG TGACAGTTGA
2281 CAGCGACAGC TATCAGTTGC TCAAGGCATA TATGATGTCA ATATCTCCGG TCTGGTAAGC
2341 ACAACCATGC AGAATGAAGC CCGTCGTCTG CGTGCCGAAC GCTGGAAAGC GGAAAATCAG
2401 GAAGGGATGG CTGAGGTCGC CCGGTTTATT GAAATGAACG GCTCTTTTGC TGACGAGAAC
2461 AGGGACTGGT GAAATGCAGT TTAAGTTTA CACCTATAAA AGAGAGAGCC GTTATCGTCT
2521 GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCGGG CGACGGATGG TGATCCCCCT
2581 GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA CTTTACCCGG TGGTG CATAT
2641 CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC AGTGTGCCGG TCTCCGTTAT
2701 CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC ATCAAAAACG CCATTAACCT
2761 GATGTTCTGG GGAATATAAA TGTCAGGCTC CTTATACAC AGCCAGTCTG CAGGTCGACC
2821 ATAGTGA CTG GATATGTTGT GTTTTACAGT ATTATGTAGT CTGTTTTTTA TGCAAAATCT
2881 AATTTAATAT ATTGATATTT ATATCATTTT ACGTTTCTCG TTCAGCTTTC TTGTACAAAG
2941 TGGTGATGCC CATATGGGAA TTCAAAGGCC TACGTCGACG AGCTCACTAG TCGCGGCCGC
3001 TTCTAGAGGA TCCCTCGAGG CATGCGGTAC CAAGCTTGGC TGTTTTGGCG GATGAGAGAA
3061 GATTTTCAGC CTGATACAGA TTAAATCAGA ACGCAGAAGC GGTCTGATAA AACAGAATTT
3121 GCCTGGCGGC AGTAGCGCGG TGGTCCCACC TGACCCCATG CCGAACTCAG AAGTGAAACG
3181 CCGTAGCGCC GATGGTAGTG TGGGGTCTCC CCATGCGAGA GTAGGGA ACT GCCAGGCATC
3241 AAATAAAACG AAAGGCTCAG TCGAAAGACT GGGCCTTTTCG TTTTATCTGT TGTTTGTGCG
3301 TGAACGCTCT CCTGAGTAGG ACAAATCCGC CGGGAGCGGA TTTGAACGTT GCGAAGCAAC
3361 GGCCCGGAGG GTGGCGGGCA GGACGCCCGC CATAAACTGC CAGGCATCAA ATTAAGCAGA
3421 AGGCCATCCT GACGGATGGC CTTTTTGC GT TTCTACAAAC TCTTTTTGTT TATTTTTCTA
3481 AATACATTCA AATATGTATC CGCTCATGAG ACAATAACCC TGATAAATGC TTCAATAATA
3541 TTGAAAAAGG AAGAGTATGA GTATTCAACA TTTCCGTGTC GCCCTTATTC CCTTTTTTGC
3601 GGCATTTTGC CTTCTGT TTTGCTCACCC AGAAACGCTG GTGAAAGTAA AAGATGCTGA
3661 AGATCAGTTG GGTGCACGAG TGGGTTACAT CGAACTGGAT CTCAACAGCG GTAAGATCCT
3721 TGAGAGTTTT CGCCCCGAAG AACGTTTTCC AATGATGAGC ACTTTTAAAG TTCTGCTATG
3781 TGGCGCGGTA TTATCCCGTG TTGACGCCGG GCAAGAGCAA CTCGGTCGCC GCATACACTA
3841 TTCTCAGAAT GACTTGGTTG AGTACTCACC AGTCACAGAA AAGCATCTTA CGGATGGCAT
3901 GACAGTAAGA GAATTATGCA GTGCTGCCAT AACCATGAGT GATAAACTG CGGCCAACTT
3961 ACTTCTGACA ACGATCGGAG GACCGAAGGA GCTAACCGCT TTTTGCACA ACATGGGGGA
4021 TCATGTA ACT CGCCTTGATC GTTGGGAACC GGAGCTGAAT GAAGCCATAC CAAACGACGA
4081 GCGTGACACC ACGATGCCTA CAGCAATGGC AACAACGTTG CGCAA ACTAT TAACTGGCGA
4141 ACTACTTACT CTAGCTTCCC GGCAACAATT AATAGACTGG ATGGAGGCGG ATAAAGTTGC

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FIG.22C

4201 AGGACCACTT CTGCGCTCGG CCCTTCCGGC TGGCTGGTTT ATTGCTGATA AATCTGGAGC
 4261 CGGTGAGCGT GGGTCTCGCG GTATCATTGC AGCACTGGGG CCAGATGGTA AGCCCTCCCG
 4321 TATCGTAGTT ATCTACACGA CGGGGAGTCA GGCAACTATG GATGAACGAA ATAGACAGAT
 4381 CGCTGAGATA GGTGCCTCAC TGATTAAGCA TTGGTAACTG TCAGACCAAG TTTACTCATA
 4441 TATACTTTAG ATTGATTAA AACTTCATTT TTAATTTAAA AGGATCTAGG TGAAGATCCT
 4501 TTTTGATAAT CTCATGACCA AAATCCCTTA ACGTGAGTTT TCGTTCCACT GAGCGTCAGA
 4561 CCCCCTAGAA AAGATCAAAG GATCTTCTTG AGATCCTTTT TTTCTGCGCG TAATCTGCTG
 4621 CTTGCAAACA AAAAAACCAC CGCTACCAGC GGTGGTTTGT TTGCCGGATC AAGAGCTACC
 4681 AACTCTTTTT CCGAAGGTAA CTGGCTTCAG CAGAGCGCAG ATACCAAATA CTGTCCTTCT
 4741 AGTGTAGCCG TAGTTAGGCC ACCACTTCAA GAACTCTGTA GCACCGCCTA CATACTCGC
 4801 TCTGCTAATC CTGTTACCAG TGGCTGCTGC CAGTGGCGAT AAGTCGTGTC TTACCGGGTT
 4861 GGA CTCAAGA CGATAGTTAC CGGATAAGGC GCAGCGGTCG GGCTGAACGG GGGGTTCTGT
 4921 CACACAGCCC AGCTTGGAGC GAACGACCTA CACCGAACTG AGATACCTAC AGCGTGAGCT
 4981 ATGAGAAAGC GCCACGCTTC CCGAAGGGAG AAAGGCGGAC AGGTATCCGG TAAGCGGCAG
 5041 GGTCGGAACA GGAGAGCGCA CGAGGGAGCT TCCAGGGGGA AACGCCTGGT ATCTTTATAG
 5101 TCCTGTCGGG TTTCGCCACC TCTGACTTGA GCGTCGATTT TTGTGATGCT CGTCAGGGGG
 5161 GCGGAGCCTA TGGAAAAACG CCAGCAACGC GGCCTTTTTA CGGTTCTTGG CCTTTTGCTG
 5221 GCCTTTTGCT CACATGTTCT TTCCTGCGTT ATCCCCTGAT TCTGTGGATA ACCGTATTAC
 5281 CGCCTTTGAG TGAGCTGATA CCGCTCGCCG CAGCCGAACG ACCGAGCGCA GCGAGTCAGT
 5341 GAGCGAGGAA GCGGAAGAGC GCCTGATGCG GTATTTTCTC CTTACGCATC TGTGCGGTAT
 5401 TTCACACCGC ATAATTTTGT TAAAATTCGC GTTAAATTTT TGTTAAATCA GCTCATTTTT
 5461 TAACCAATAG GCCGAAATCG GCAAAATCCC TTATAAATCA AAAGAATAGA CCGAGATAGG
 5521 GTTGAGTGTT GTTCCAGTTT GGAACAAGAG TCCACTATTA AAGAACGTGG ACTCCAACGT
 5581 CAAAGGGCGA AAAACCGTCT ATCAGGGCGA TGGCCCACTA CGTGAACCAT CACCCTAATC
 5641 AAGTTTTTTG GGGTCGAGGT GCCGTAAAGC ACTAAATCGG AACCCTAAAG GGAGCCCCCG
 5701 ATTTAGAGCT TGACGGGGAA AGCCGGCGAA CGTGGCGAGA AAGGAAGGGA AGAAAGCGAA
 5761 AGGAGCGGGC GCTAGGGCGC TGGCAAGTGT AGCGGTCACG CTGCGCGTAA CCACCACACC
 5821 CGCCGCGCTT AATGCGCCGC TACAGGGCGC GTCCCATTCT CCATTACAGC TGCTATGGTG
 5881 CACTCTCAGT ACAATCTGCT CTGATGCCGC ATAGTTAAGC CAGTATACAC TCCGCTATCG
 5941 CTACGTGACT GGGTCATGGC TGCGCCCCGA CACCCGCCAA CACCCGCTGA CGCGCCCTGA
 6001 CGGGCTTGTC TGCTCCCGGC ATCCGCTTAC AGACAAGCTG TGACCGTCTC CGGGAGCTGC
 6061 ATGTGTCAGA GGTTTTCACC GTCATCACCG AAACGCGCGA GGCAGCAGAT CAATTCGCGC
 6121 GCGAAGGCGA AGCGGCATGC ATTTACGTTG ACACCATCGA ATGGTGCAAA ACCTTTCGCG
 6181 GTATGGCATG ATAGCGCCCG GAAGAGAGTC AATTCAGGGT GGTGAATGTG AAACCAGTAA
 6241 CGTTATACGA TGTCGCAGAG TATGCCGGTG TCTCTTATCA GACCGTTTCC CGCGTGGTGA
 6301 ACCAGGCCAG CCACGTTTCT GCGAAAACGC GGGAAAAAGT GGAAGCGGCG ATGGCGGAGC
 6361 TGAATTACAT TCCAACCGC GTGGCACAAC AACTGGCGGG CAAACAGTCG TTGCTGATTG
 6421 GCGTTGCCAC CTCCAGTCTG GCCCTGCACG CGCCGTCGCA AATTGTCGCG GCGATTAAAT
 6481 CTCGCGCCGA TCAACTGGGT GCCAGCGTGG TGGTGTGAT GGTAGAACGA AGCGGCGTCG
 6541 AAGCCTGTAA AGC

FIG.22D

40/253

GST FUSIONS IN E. COLI

154 cgg ttc tgg caa ata ttc tga aat gag ctg ttg aca att aat cat cgg ctc
gcc aag acc gtt tat aag act tta ctc gac aac tgt taa tta gla gcc gag

205 gta taa tgt gtg gaa ttg tga gcg gat aac aat ttc aca cag gaa aca gla
cat att aca cac ctt aac act cgc cta ttg tta aag tgt glc ctt tgt cat

256 M S P I L → GST
ttc atg tcc cct ata cta ggt tat tgg aaa att aag ggc ctt glg caa ccc
aag tac agg gga tat gat cca ata acc ttt taa ttc ccg gaa cac gtt ggg

... GST → R G S R R A S V G S P S T S
919 ctg gtt ccg cgt gga tct cgt cgt gca tct gtt gga tcc cca tca aca agt
gac caa ggc gca cct aga gca gca cgt aga caa cct agg ggt agt tgt tca
attR1

L Y K K
970 ttg tac aag aag gct gaa cga gaa acg taa aat gat ata aat atc aat ata
aac atg ttt ttt cga ctt gct ctt tgc att tta cta tat tta tag tta tat

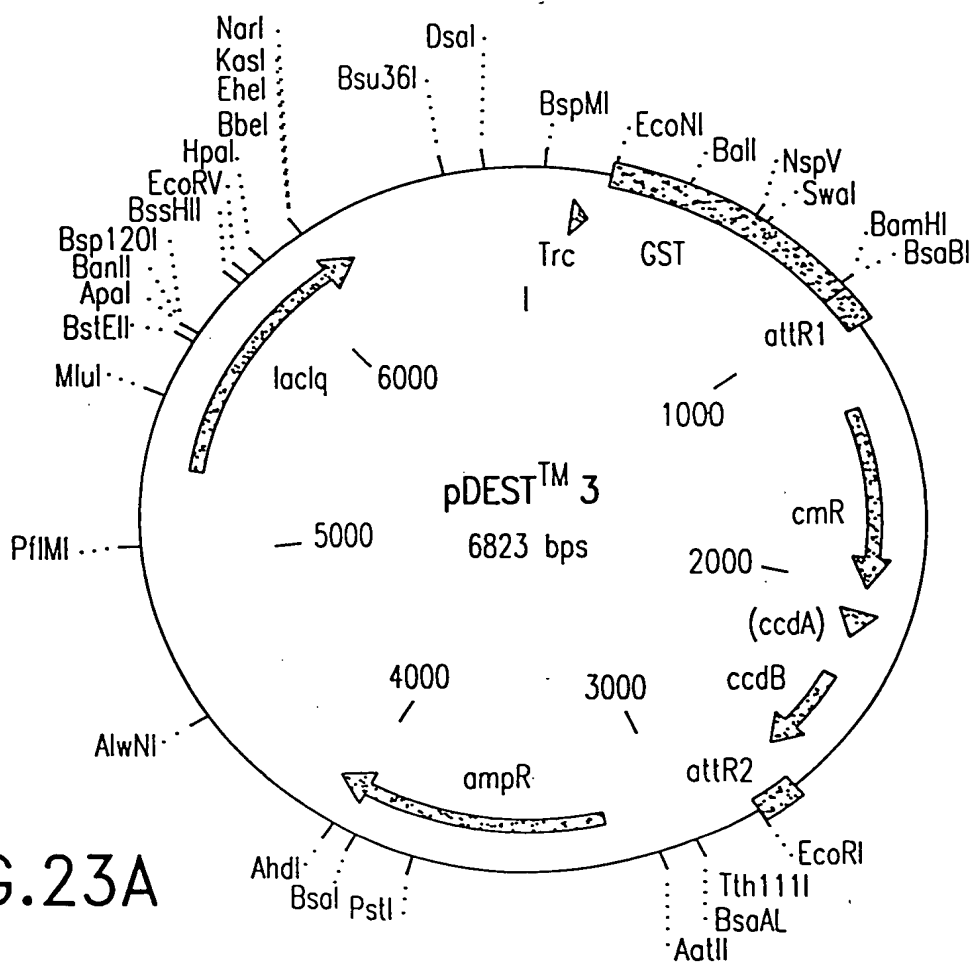


FIG.23A

41/253

pDEST3 6823 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
150..200	Trc
1087..963	attR1
1337..1996	CmR
2116..2200	inactivated ccdA
2338..2643	ccdB
2684..2808	attR2
3231..4091	ampR
5295..6254	lacIq

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1  ACGTTATCGA CTGCACGGTG CACCAATGCT TCTGGCGTCA GGCAGCCATC GGAAGCTGTG
61 GTATGGCTGT GCAGGTCGTA AATCACTGCA TAATTCGTGT CGCTCAAGGC GCACTCCCGT
121 TCTGGATAAT GTTTTTTGCG CCGACATCAT AACGGTTCTG GCAAATATTC TGAAATGAGC
181 TGTTGACAAT TAATCATCGG CTCGTATAAT GTGTGGAATT GTGAGCGGAT AACAAATTCA
241 CACAGGAAAC AGTATTCATG TCCCCTATAC TAGGTTATTG GAAAATTAAG GGCCTTGTGC
301 AACCCACTCG ACTTCTTTTG GAATATCTTG AAGAAAAATA TGAAGAGCAT TTGTATGAGC
361 GCGATGAAGG TGATAAATGG CGAAACAAAA AGTTTGAATT GGGTTTGGAG TTTCCCAATC
421 TTCCTTATTA TATTGATGGT GATGTTAAAT TAACACAGTC TATGGCCATC ATACGTTATA
481 TAGCTGACAA GCACAACATG TTGGGTGGTT GTCCAAAAGA GCGTGCAGAG ATTTCAATGC
541 TTGAAGGAGC GGTTTTGGAT ATTAGATACG GTGTTTCGAG AATTGCATAT AGTAAAGACT
601 TTGAAACTCT CAAAGTTGAT TTTCTTAGCA AGCTACCTGA AATGCTGAAA ATGTTCGAAG
661 ATCGTTTATG TCATAAAACA TATTTAAATG GTGATCATGT AACCCATCCT GACTTCATGT
721 TGTATGACGC TCTTGATGTT GTTTTATACA TGGACCCAAT GTGCCTGGAT GCGTTCCCAA
781 AATTAGTTTG TTTTAAAAAA CGTATTGAAG CTATCCCACA AATTGATAAG TACTTGAAAT
841 CCAGCAAGTA TATAGCATGG CCTTTCAGG GCTGGCAAGC CACGTTTGGT GGTGGCGACC
901 ATCCTCCAAA ATCGGATCTG GTTCCGCGTG GATCTCGTCG TGCATCTGTT GGATCCCCAT
961 CAACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA TGATATAAAT ATCAATATAT
1021 TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG TAAACACAA CATATCCAGT
1081 CACTATGGCG GCCGCTAAGT TGGCAGCATC ACCCGACGCA CTTTGCGCCG AATAAATACC
1141 TGTGACGGAA GATCACTTCG CAGAATAAAT AAATCCTGGT GTCCCTGTTG ATACCGGGAA
1201 GCCCTGGGCC AACTTTTGGC GAAAATGAGA CGTTGATCGG CACGTAAGAG GTTCCAACCT
1261 TCACCATAAT GAAATAAGAT CACTACCGGG CGTATTTTTT GAGTTATCGA GATTTTCAGG
1321 AGCTAAGGAA GCTAAAATGG AGAAAAAAT CACTGGATAT ACCACCGTTG ATATATCCCA
1381 ATGGCATCGT AAAGAACATT TTGAGGCATT TCAGTCAGTT GCTCAATGTA CCTATAACCA
1441 GACCGTTCAG CTGGATATTA CGGCCTTTTT AAAGACCGTA AAGAAAAATA AGCACAAGTT
1501 TTATCCGGCC TTTATTCACA TTCTTGCCCG CCTGATGAAT GCTCATCCGG AATTCCGTAT
1561 GGCAATGAAA GACGGTGAGC TGGTGATATG GGATAGTGTT CACCCTTGTT ACACCGTTTT
1621 CCATGAGCAA ACTGAAACGT TTTCATCGCT CTGGAGTGAA TACCACGACG ATTTCCGGCA
1681 GTTTCTACAC ATATATTCGC AAGATGTGGC GTGTTACGGT GAAAACCTGG CCTATTTCCC
1741 TAAAGGGTTT ATTGAGAATA TGTTTTTCGT CTCAGCCAAT CCCTGGGTGA GTTTCACCAG
1801 TTTTGATTTA AACGTGGCCA ATATGGACAA CTTCTTCGCC CCCGTTTTCA CCATGGGCAA

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FIG.23B

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1861 ATATTATACG CAAGGCGACA AGGTGCTGAT GCCGCTGGCG ATTCAGGTTC ATCATGCCGT
1921 CTGTGATGGC TTCCATGTCG GCAGAATGCT TAATGAATTA CAACAGTACT GCGATGAGTG
1981 GCAGGGCGGG GCGTAAAGAT CTGGATCCGG CTTACTAAAA GCCAGATAAC AGTATGCGTA
2041 TTTGCGCGCT GATTTTTGCG GTATAAGAAT ATATACTGAT ATGTATACCC GAAGTATGTC
2101 AAAAAGAGGT GTGCTATGAA GCAGCGTATT ACAGTGACAG TTGACAGCGA CAGCTATCAG
2161 TTGCTCAAGG CATATATGAT GTCAATATCT CCGGTCTGGT AAGCACAACC ATGCAGAATG
2221 AAGCCCCTCG TCTGCGTGCC GAACGCTGGA AAGCGGAAAA TCAGGAAGGG ATGGCTGAGG
2281 TCGCCCGGTT TATTGAAATG AACGGCTCTT TTGCTGACGA GAACAGGGAC TGGTGAAATG
2341 CAGTTTAAGG TTTACACCTA TAAAAGAGAG AGCCGTTATC GTCTGTTTGT GGATGTACAG
2401 AGTGATATTA TTGACACGCC CGGGCGACGG ATGGTGATCC CCCTGGCCAG TGCACGTCTG
2461 CTGTCAGATA AAGTCTCCCG TGAACTTTAC CCGGTGGTGC ATATCGGGGA TGAAAGCTGG
2521 CGCATGATGA CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA AGAAGTGGCT
2581 GATCTCAGCC ACCGCGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT CTGGGGAATA
2641 TAAATGTCAG GCTCCCTTAT ACACAGCCAG TCTGCAGGTC GACCATAGTG ACTGGATATG
2701 TTGTGTTTTA CAGTATTATG TAGTCTGTTT TTTATGCAAA ATCTAATTTA ATATATTGAT
2761 ATTTATATCA TTTTACGTTT CTCGTTGAGC TTTCTTGAC AAAGTGGTTG ATGGGAATTC
2821 ATCGTGACTG ACTGACGATC TGCCTCGCGC GTTTCGGTGA TGACGGTGAA AACCTCTGAC
2881 ACATGCAGCT CCCGGAGACG GTCACAGCTT GTCTGTAAGC GGATGCCGGG AGCAGACAAG
2941 CCCGTCAGGG CGCGTCAGCG GGTGTTGGCG GGTGTCGGGG CGCAGCCATG ACCCAGTCAC
3001 GTAGCGATAG CGGAGTGTAT AATTCTTGAA GACGAAAGGG CCTCGTGATA CGCCTATTTT
3061 TATAGGTAA TGTCATGATA ATAATGGTTT CTTAGACGTC AGGTGGCACT TTTCGGGGAA
3121 ATGTGCGCGG AACCCTATT TGTTTATTTT TCTAAATACA TTCAAATATG TATCCGCTCA
3181 TGAGACAATA ACCCTGATAA ATGCTTCAAT AATATTGAAA AAGGAAGAGT ATGAGTATTC
3241 AACATTTCCG TGTCGCCCTT ATTCCCTTTT TTGCGGCATT TTGCCTTCCT GTTTTTGCTC
3301 ACCCAGAAAC GCTGGTGAAA GTAAAAGATG CTGAAGATCA GTTGGGTGCA CGAGTGGGTT
3361 ACATCGAACT GGATCTCAAC AGCGGTAAGA TCCTTGAGAG TTTTCGCCCC GAAGAACGTT
3421 TTCCAATGAT GAGCACTTTT AAAGTTCTGC TATGTGGCGC GGTATTATCC CGTGTTGACG
3481 CCGGGCAAGA GCAACTCGGT CGCCGCATAC ACTATTCTCA GAATGACTTG GTTGAGTACT
3541 CACCAGTCAC AGAAAAGCAT CTTACGGATG GCATGACAGT AAGAGAATTA TGCAGTGCTG
3601 CCATAACCAT GAGTGATAAC ACTGCGGCCA ACTTACTTCT GACAACGATC GGAGGACCGA
3661 AGGAGCTAAC CGCTTTTTTG CACAACATGG GGGATCATGT AACTCGCCTT GATCGTTGGG
3721 AACCGGAGCT GAATGAAGCC ATACCAAACG ACGAGCGTGA CACCACGATG CCTGCAGCAA
3781 TGGCAACAAC GTTGCGCAA CTATTAAGTG GCGAACTACT TACTCTAGCT TCCCGGCAAC
3841 AATTAATAGA CTGGATGGAG GCGGATAAAG TTGCAGGACC ACTTCTGCGC TCGGCCCTTC
3901 CGGCTGGCTG GTTTATTGCT GATAAATCTG GAGCCGGTGA GCGTGGGTCT CGCGGTATCA
3961 TTGCAGCACT GGGGCCAGAT GGTAAGCCCT CCCGTATCGT AGTTATCTAC ACGACGGGGA
4021 GTCAGGCAAC TATGGATGAA CGAAATAGAC AGATCGCTGA GATAGGTGCC TCACTGATTA
4081 AGCATTGGTA ACTGTCAGAC CAAGTTTACT CATATATACT TTAGATTGAT TTAAGACTTC
4141 ATTTTAAATT TAAAAGGATC TAGGTGAAGA TCCTTTTTGA TAATCTCATG ACCAAAATCC
4201 CTTAACGTGA GTTTTCGTTT CACTGAGCGT CAGACCCCGT AGAAAAGATC AAAGGATCTT
4261 CTTGAGATCC TTTTTTCTG CGCGTAATCT GCTGCTTGCA AACAAAAAAA CCACCGCTAC

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FIG.23C

4321 CAGCGGTGGT TTGTTTGCCG GATCAAGAGC TACCAACTCT TTTTCCGAAG GTAAGTGGCT
 4381 TCAGCAGAGC GCAGATACCA AATACTGTCC TTCTAGTGTA GCCGTAGTTA GGCCACCACT
 4441 TCAAGAACTC TGTAGCACCG CCTACATACC TCGCTCTGCT AATCCTGTTA CCAGTGGCTG
 4501 CTGCCAGTGG CGATAAGTCG TGTCTTACCG GGTTGGACTC AAGACGATAG TTACCGGATA
 4561 AGGCGCAGCG GTCGGGCTGA ACGGGGGGTT CGTGACACA GCCCAGCTTG GAGCGAACGA
 4621 CCTACACCGA ACTGAGATAC CTACAGCGTG AGCTATGAGA AAGCGCCACG CTTCCCGAAG
 4681 GGAGAAAGGC GGACAGGTAT CCGGTAAGCG GCAGGGTCCG AACAGGAGAG CGCACGAGGG
 4741 AGCTTCCAGG GGGAAACGCC TGGTATCTTT ATAGTCCTGT CGGGTTTCGC CACCTCTGAC
 4801 TTGAGCGTCG ATTTTGTGA TGCTCGTCAG GGGGCGGAG CCTATGGAAA AACGCCAGCA
 4861 ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT TGCTCACATG TTCTTTCCTG
 4921 CGTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCCTT TGAGTGAGCT GATACCGCTC
 4981 GCCGCAGCCG AACGACCGAG CGCAGCGAGT CAGTGAGCGA GGAAGCGGAA GAGCGCCTGA
 5041 TGCGGTATTT TCTCCTTACG CATCTGTGCG GTATTTTACA CCGCATAAAT TCCGACACCA
 5101 TCGAATGGTG CAAAACCTTT CGCGGTATGG CATGATAGCG CCCGGAAGAG AGTCAATTCA
 5161 GGGTGGTGAA TGTGAAACCA GTAACGTTAT ACGATGTGCG AGAGTATGCC GGTGTCTCTT
 5221 ATCAGACCGT TTCCCGCGTG GTGAACCAGG CCAGCCACGT TTCTGCGAAA ACGCGGGAAA
 5281 AAGTGGAAGC GGCGATGGCG GAGCTGAATT ACATTCCCAA CCGCGTGGCA CAACAACTGG
 5341 CGGGCAAACA GTCGTTGCTG ATTGGCGTTG CCACCTCCAG TCTGGCCCTG CACGCGCCGT
 5401 CGCAAATTGT CGCGGCGATT AAATCTCGCG CCGATCAACT GGGTGCCAGC GTGGTGGTGT
 5461 CGATGGTAGA ACGAAGCGGC GTCGAAGCCT GTAAAGCGGC GGTGCACAAT CTTCTCGCGC
 5521 AACGCGTCAG TGGGCTGATC ATTAACCTATC CGCTGGATGA CCAGGATGCC ATTGCTGTGG
 5581 AAGCTGCCTG CACTAATGTT CCGGCGTTAT TTCTTGATGT CTCTGACCAG ACACCCATCA
 5641 ACAGTATTAT TTTCTCCCAT GAAGACGGTA CGCGACTGGG CGTGGAGCAT CTGGTCGCAT
 5701 TGGGTACCA GCAAATCGCG CTGTTAGCGG GCCCATTAAG TTCTGTCTCG GCGCGTCTGC
 5761 GTCTGGCTGG CTGGCATAAA TATCTCACTC GCAATCAAAT TCAGCCGATA GCGGAACGGG
 5821 AAGGCGACTG GAGTGCCATG TCCGGTTTTT AACAAACCAT GCAAATGCTG AATGAGGGCA
 5881 TCGTTCCAC TGCATGCTG GTTGCCAACG ATCAGATGGC GCTGGGCGCA ATGCGCGCCA
 5941 TTACCGAGTC CGGGCTGCGC GTTGGTGCGG ATATCTCGGT AGTGGGATAC GACGATACCG
 6001 AAGACAGCTC ATGTTATATC CCGCCGTAA CCACCATCAA ACAGGATTTT CGCCTGCTGG
 6061 GGCAAACCAG CGTGGACCGC TTGCTGCAAC TCTCTAGGG CCAGGCGGTG AAGGGCAATC
 6121 AGCTGTTGCC CGTCTCACTG GTGAAAAGAA AAACCACCCT GGCGCCCAAT ACGCAAACCG
 6181 CCTCTCCCCG CGCGTTGGCC GATTCAATTA TGCAGCTGGC ACGACAGGTT TCCCGACTGG
 6241 AAAGCGGGCA GTGAGCGCAA CGCAATTAAT GTGAGTTAGC TCACTCATTA GGCACCCAG
 6301 GCTTTACACT TTATGCTTCC GGCTCGTATG TTGTGTGGAA TTGTGAGCGG ATAACAATTT
 6361 CACACAGGAA ACAGCTATGA CCATGATTAC GGATTCACTG GCCGTCGTTT TACAACGTCG
 6421 TGAAGGGGAA AACCCTGGCG TTACCCAAT TAATCGCCTT GCAGCACATC CCCCTTTCGC
 6481 CAGCTGGCGT AATAGCGAAG AGGCCCGCAC CGATCGCCCT TCCCAACAGT TGCAGGCCT
 6541 GAATGGCGAA TGGCGCTTTG CCTGGTTTCC GGCACCAGAA GCGGTGCCGG AAAGCTGGCT
 6601 GGAGTGCGAT CTTCTGAGG CCGATACTGT CGTCGTCCCC TCAAACCTGGC AGATGCACGG
 6661 TTACGATGCG CCCATCTACA CCAACGTAAC CTATCCCAT ACGGTCAATC CGCCGTTTGT
 6721 TCCCACGGAG AATCCGACGG GTTGTTACTC GCTCACATTT AATGTTGATG AAAGCTGGCT
 6781 ACAGGAAGGC CAGACGCGAA TTATTTTGA TGGCGTTGGA ATT

FIG.23D

His6-THIOREDOXIN FUSIONS IN E. COLI

919 gca aat att ctg aaa tga gct gtt gac aat tac tca tcc ggt ccg tat aat
cgt tta taa gac ttt act cga caa ctg tta att agt agg cca ggc ata tta

970 ctg tgg  aat tgt gag cgg ata aca att tca cac agg aaa cag acc atg ggt
 gac acc tta oca ctc gcc tat tgt taa agt gtg tcc ttt gtc tgg tac cca

His6
 1021 His His His His His His Asp Tyr Asp Ile Pro Thr Thr Gly Asn Leu Tyr
 cat cat cat cat cat cac gat tac gat atc cca acg acc gaa aac ctg tat
 gta gta gta gta gta gtg cta atg cta tag ggt tgc tgg ctt ttg gac ata
 TEV PROTEASE —————→ THIOREDOXIN ————— (~150 AMINO ACIDS)
 1072 Phe Gln Gly Ala His Met Ser Asp Lys Ile Ile His Leu Thr Asp Asp Ser
 ttt cag ggc gcc cat atg agc gat aaa att att cac ctg act gac gac agt
 aaa gtc ccg cgg gta tac tcg cta ttt taa taa gtg gac tga ctg ctg tca
 attR1
 1429 Asp Asp Asp Asp Lys Val Pro Ile Thr Ser Leu Tyr Lys Lys
 gat gac gat gac aag gta ccc atc aca agt ttg tac aag aag gct gaa cga
 cta ctg cta ctg ttc cat ggg tag tgt tca aac atg ttt ttt aag ctt gct

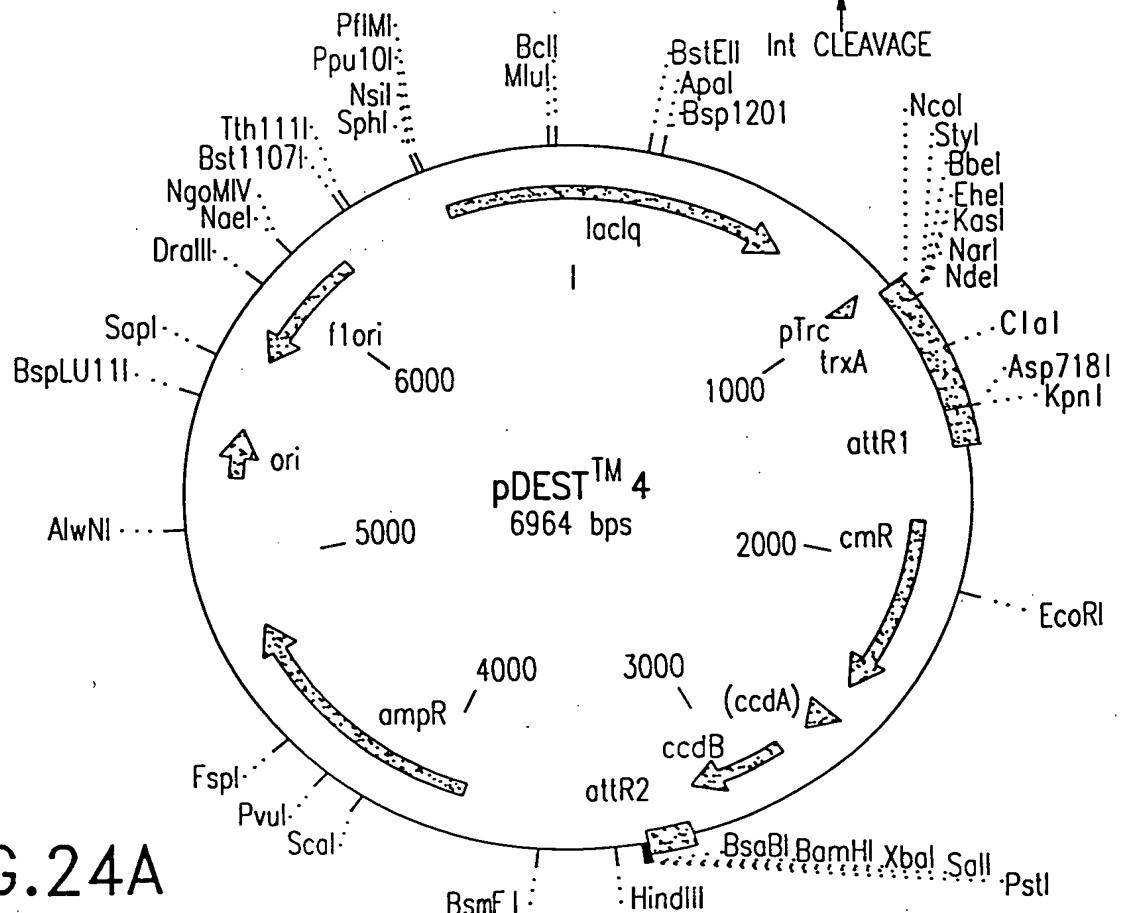


FIG. 24A

45/253

pDEST4 6964 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
964..1003	Trc
1577..1453	attR1
1827..2486	CmR
2606..2690	inactivated ccdA
2828..3133	ccdB
3174..3298	attR2
3872..4777	ampR
5378..5538	ori
5778..6215	flori (f1 intergenic region)
6587..704	lacIq

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1 CTATCCGCTG GATGACCAGG ATGCCATTGC TGTGGAAGCT GCCTGCACTA ATGTTCCGGC
61 GTTATTTCTT GATGTCTCTG ACCAGACACC CATCAACAGT ATTATTTTCT CCCATGAAGA
121 CGGTACGCGA CTGGGCGTGG AGCATCTGGT CGCATTGGGT CACCAGCAAA TCGCGCTGTT
181 AGCGGGGCCA TTAAGTTCTG TCTCGGCGCG TCTGCGTCTG GCTGGCTGGC ATAAATATCT
241 CACTCGCAAT CAAATTCAGC CGATAGCGGA ACGGGAAGGC GACTGGAGTG CCATGTCCGG
301 TTTTCAACAA ACCATGCAAA TGCTGAATGA GGGCATCGTT CCCACTGCGA TGCTGGTTGC
361 CAACGATCAG ATGGCGCTGG GCGCAATGCG CGCCATTACC GAGTCCGGGC TCGCGGTTGG
421 TGCGGATATC TCGGTAGTGG GATACGACGA TACCGAAGAC AGCTCATGTT ATATCCCGCC
481 GTCAACCACC ATCAAACAGG ATTTTCGCCT GCTGGGGCAA ACCAGCGTGG ACCGCTTGCT
541 GCAACTCTCT CAGGGCCAGG CGGTGAAGGG CAATCAGCTG TTGCCGCTCT CACTGGTGAA
601 AAGAAAAACC ACCCTGGCAC CCAATACGCA AACCGCCTCT CCCCgcgcgt TGGCCGATTC
661 ATTAATGCAG CTGGCACGAC AGGTTTCCCG ACTGGAAAGC GGGCAGTGAG CGCAACGCAA
721 TTAATGTGAG TTAGCGCGAA TTGATCTGGT TTGACAGCTT ATCATCGACT GCACGGTGCA
781 CCAATGCTTC TGGCGTCAGG CAGCCATCGG AAGCTGTGGT ATGGCTGTGC AGGTCGTAAA
841 TCACTGCATA ATTCGTGTCG CTCAAGGCGC ACTCCCGTTC TGGATAATGT TTTTTCGCC
901 GACATCATAA CGGTTCTGGC AAATATTCTG AAATGAGCTG TTGACAATTA ATCATCCGGT
961 CCGTATAATC TGTGGAATTG TGAGCGGATA ACAATTTTAC ACAGGAAACA GACCATGGGT
1021 CATCATCATC ATCATCACGA TTACGATATC CCAACGACCG AAAACCTGTA TTTTCAGGGC
1081 GCCCATATGA GCGATAAAAT TATTCACCTG ACTGACGACA GTTTTGACAC GGATGTACTC
1141 AAAGCGGACG GGGCGATCCT CGTCGATTTC TGGGCAGAGT GGTGCGGTCC GTGCAAAATG
1201 ATCGCCCCGA TTCTGGATGA AATCGCTGAC GAATATCAGG GCAAACCTGAC CGTTGCAAAA
1261 CTGAACATCG ATCAAAACCC TGGCACTGCG CCGAAATATG GCATCCGTGG TATCCCGACT
1321 CTGCTGCTGT TCAAAAACGG TGAAGTGGCG GCAACCAAAG TGGGTGCACT GTCTAAAGGT
1381 CAGTTGAAAG AGTTCCTCGA CGCTAACCTG GCCGGTTCTG GTTCTGGTGA TGACGATGAC
1441 AAGGTACCCA TCACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA TGATATAAAT
1501 ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG TAAAACACAA
1561 CATATCCAGT CACTATGGCG GCCGCTAAGT TGGCAGCATC ACCCGACGCA CTTTTCGCCG
1621 AATAAATACC TGTGACGGAA GATCACTTCG CAGAATAAAT AAATCCTGGT GTCCCTGTTG
1681 ATACCGGGAA GCCCTGGGCC AACTTTTGGC GAAAATGAGA CGTTGATCGG CACGTAAGAG

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FIG.24B

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1741 GTTCCAAC TT TCACCATAAT GAAATAAGAT CACTACCGGG CGTATTTTTT GAGTTATCGA
1801 GATTTTCAGG AGCTAAGGAA GCTAAAATGG AGAAAAAAT CACTGGATAT ACCACCGTTG
1861 ATATATCCCA ATGGCATCGT AAAGAACATT TTGAGGCATT TCAGTCAGTT GCTCAATGTA
1921 CCTATAACCA GACCGTTCAG CTGGATATTA CGGCCTTTTT AAAGACCGTA AAGAAAAATA
1981 AGCACAAGTT TTATCCGGCC TTTATTCACA TTCTTGCCCG CCTGATGAAT GCTCATCCGG
2041 AATTCCGTAT GGCAATGAAA GACGGTGAGC TGGTGATATG GGATAGTGTT CACCCTTGTT
2101 ACACCGTTTT CCATGAGCAA ACTGAAACGT TTTTCATCGCT CTGGAGTGAA TACCACGACG
2161 ATTTCCGGCA GTTTCTACAC ATATATTTCG AAGATGTGGC GTGTTACGGT GAAAACCTGG
2221 CCTATTTCCC TAAAGGGTTT ATTGAGAATA TGTTTTTCGT CTCAGCCAAT CCCTGGGTGA
2281 GTTTCACCAG TTTTGATTTA AACGTGGCCA ATATGGACAA CTTCTTCGCC CCCGTTTTCA
2341 CCATGGGCAA ATATTATACG CAAGGCGACA AGGTGCTGAT GCCGCTGGCG ATTCAGGTTT
2401 ATCATGCCGT CTGTGATGGC TTCCATGTCG GCAGAATGCT TAATGAATTA CAACAGTACT
2461 GCGATGAGTG GCAGGGCGGG GCGTAAACGC GTGGATCCGG CTTACTAAAA GCCAGATAAC
2521 AGTATGCGTA TTTGCGCGCT GATTTTTCG GTATAAGAAT ATATACTGAT ATGTATACCC
2581 GAAGTATGTC AAAAAGAGGT GTGCTATGAA GCAGCGTATT ACAGTGACAG TTGACAGCGA
2641 CAGCTATCAG TTGCTCAAGG CATATATGAT GTCAATATCT CCGGTCTGGT AAGCACAACC
2701 ATGCAGAAATG AAGCCCGTCG TCTGCGTGCC GAACGCTGGA AAGCGGAAAA TCAGGAAGGG
2761 ATGGCTGAGG TCGCCCGGTT TATTGAAATG AACGGCTCTT TTGCTGACGA GAACAGGGAC
2821 TGGTGAAATG CAGTTTAAGG TTTACACCTA TAAAAGAGAG AGCCGTTATC GTCTGTTTGT
2881 GGATGTACAG AGTGATATTA TTGACACGCC CGGGCGACGG ATGGTGATCC CCCTGGCCAG
2941 TGCACGTCTG CTGTCAGATA AAGTCTCCCG TGAAC TTTAC CCGGTGGTGC ATATCGGGGA
3001 TGAAAGCTGG CGCATGATGA CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA
3061 AGAAGTGGCT GATCTCAGCC ACCGCGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT
3121 CTGGGGAATA TAAATGTCAG GCTCCCTTAT ACACAGCCAG TCTGCAGGTC GACCATAGTG
3181 ACTGGATATG TTGTGTTTTA CAGTATTATG TAGTCTGTTT TTTATGCAAA ATCTAATTTA
3241 ATATATTGAT ATTTATATCA TTTTACGTTT CTCGTTACAG TTTCTTGTA AAAGTGGTGA
3301 TGGGGATCCT CTAGAGTCGA CCTGCAGTAA TCGTACAGGG TAGTACAAAT AAAAAAGGCA
3361 CGTCAGATGA CGTGCCTTTT TTCTTGAG CAGTAAGCTT GGCTGTTTTG GCGGATGAGA
3421 GAAGATTTTC AGCCTGATAC AGATTAAATC AGAACGCAGA AGCGGTCTGA TAAAACAGAA
3481 TTTGCCTGGC GGCAGTAGCG CGGTGGTCCC ACCTGACCCC ATGCCGAAC CAGAAGTGAA
3541 ACGCCGTAGC GCCGATGGTA GTGTGGGGTC TCCCCATGCG AGAGTAGGGA ACTGCCAGGC
3601 ATCAAATAAA ACGAAAGGCT CAGTCGAAAG ACTGGGCCTT TCGTTTTATC TGTTGTTTGT
3661 CGGTGAACGC TCTCCTGAGT AGGACAAATC CGCCGGGAGC GGATTTGAAC GTTGCGAAGC
3721 AACGGCCCGG AGGGTGGCGG GCAGGACGCC CGCCATAAAC TGCCAGGCAT CAAATTAAGC
3781 AGAAGGCCAT CCTGACGGAT GGCCTTTTTG CGTTTCTACA AACTCTTTTT GTTTATTTTT
3841 CTAAATACAT TCAAATATGT ATCCGCTCAT GAGACAATAA CCCTGATAAA TGCTTCAATA
3901 ATATTGAAAA AGGAAGAGTA TGAGTATTCA ACATTTCCGT GTCGCCCTTA TTCCCTTTTT
3961 TGCGGCATT TGCCTTCCTG TTTTGTCTCA CCCAGAAACG CTGGTGAAAG TAAAAGATGC
4021 TGAAGATCAG TTGGGTGCAC GAGTGGGTTA CATCGAACTG GATCTCAACA GCGGTAAGAT
4081 CCTTGAGAGT TTTCGCCCCG AAGAACGTTT TCCAATGATG AGCACTTTTA AAGTTCTGCT
4141 ATGTGGCGCG GTATTATCCC GTGTTGACGC CGGGCAAGAG CAACTCGGTC GCCGCATACA

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FIG.24C

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4201 CTATTCTCAG AATGACTTGG TTGAGTACTC ACCAGTCACA GAAAAGCATC TTACGGATGG
4261 CATGACAGTA AGAGAATTAT GCAGTGCTGC CATAACCATG AGTGATAACA CTGCGGCCAA
4321 CTTACTTCTG ACAACGATCG GAGGACCGAA GGAGCTAACC GCTTTTTTGC ACAACATGGG
4381 GGATCATGTA ACTCGCCTTG ATCGTTGGGA ACCGGAGCTG AATGAAGCCA TACCAAACGA
4441 CGAGCGTGAC ACCACGATGC CTACAGCAAT GGCAACAACG TTGCGCAAAC TATTAAGTGG
4501 CGAACTACTT ACTCTAGCTT CCCGGCAACA ATTAATAGAC TGGATGGAGG CGGATAAAGT
4561 TGCAGGACCA CTTCTGCGCT CGGCCCTTCC GGCTGGCTGG TTTATTGCTG ATAAATCTGG
4621 AGCCGGTGAG CGTGGGTCTC GCGGTATCAT TGCAGCACTG GGGCCAGATG GTAAGCCCTC
4681 CCGTATCGTA GTTATCTACA CGACGGGGAG TCAGGCAACT ATGGATGAAC GAAATAGACA
4741 GATCGCTGAG ATAGGTGCCT CACTGATTAA GCATTGGTAA CTGTCAGACC AAGTTTACTC
4801 ATATATACTT TAGATTGATT TAAACTTCA TTTTAAATT AAAAGGATCT AGGTGAAGAT
4861 CCTTTTTGAT AATCTCATGA CCAAATCCC TTAACGTGAG TTTTCGTTCC ACTGAGCGTC
4921 AGACCCCGTA GAAAAGATCA AAGGATCTTC TTGAGATCCT TTTTTTCTGC GCGTAATCTG
4981 CTGCTTGCAA ACAAAAAAAC CACCGCTACC AGCGGTGGTT TGTTTGCCGG ATCAAGAGCT
5041 ACCAACTCTT TTTCCGAAGG TAACTGGCTT CAGCAGAGCG CAGATACCAA ATACTGTCCT
5101 TCTAGTGTA GCGTAGTTAG GCCACCACTT CAAGAACTCT GTAGCACCGC CTACATACCT
5161 CGCTCTGCTA ATCCTGTTAC CAGTGGCTGC TGCCAGTGGC GATAAGTCGT GTCTTACCGG
5221 GTTGGACTCA AGACGATAGT TACCGGATAA GGCGCAGCGG TCGGGCTGAA CGGGGGGTTC
5281 GTGCACACAG CCCAGCTTGG AGCGAACGAC CTACACCGAA CTGAGATACC TACAGCGTGA
5341 GCTATGAGAA AGCGCCACGC TTCCGAAGG GAGAAAGGCG GACAGGTATC CGGTAAGCGG
5401 CAGGGTCGGA ACAGGAGAGC GCACGAGGGA GCTTCCAGGG GGAAACGCCT GGTATCTTTA
5461 TAGTCCTGTC GGGTTTCGCC ACCTCTGACT TGAGCGTCGA TTTTGTGAT GCTCGTCAGG
5521 GGGGCGGAGC CTATGGAAAA ACGCCAGCAA CGCGGCCTTT TTACGGTTCC TGGCCTTTTG
5581 CTGGCCTTTT GCTCACATGT TCTTCTCTGC GTTATCCCCT GATTCTGTGG ATAACCGTAT
5641 TACCGCCTTT GAGTGAGCTG ATACCGCTCG CCGCAGCCGA ACGACCGAGC GCAGCGAGTC
5701 AGTGAGCGAG GAAGCGGAAG AGCGCCTGAT GCGGTATTTT CTCCTTACGC ATCTGTGCGG
5761 TATTTACACAC CGCATAATTT TGTTAAAATT CGCGTTAAAT TTTTGTTAAA TCAGCTCATT
5821 TTTTAACCAA TAGGCCGAAA TCGGCAAAAT CCCTTATAAA TCAAAAGAAT AGACCGAGAT
5881 AGGGTTGAGT GTTGTTCAG TTTGGAACAA GAGTCCACTA TTAAAGAACG TGGACTCCAA
5941 CGTCAAAGGG CGAAAAACCG TCTATCAGGG CGATGGCCCA CTACGTGAAC CATCACCTA
6001 ATCAAGTTTT TTGGGGTCGA GGTGCCGTAA AGCACTAAAT CGGAACCCTA AAGGGAGCCC
6061 CCGATTTAGA GCTTGACGGG GAAAGCCGGC GAACGTGGCG AGAAAGGAAG GGAAGAAAGC
6121 GAAAGGAGCG GGCGCTAGGG CGCTGGCAAG TGTAGCGGTC ACGCTGCGCG TAACCACCAC
6181 ACCCGCCGCG CTTAATGCGC CGCTACAGGG CGCGTCCATT CGCCATTAG GCTGCTATGG
6241 TGCATCTCA GTACAATCTG CTCTGATGCC GCATAGTTAA GCCAGTATAC ACTCCGCTAT
6301 CGCTACGTGA CTGGGTCATG GCTGCGCCCC GACACCCGCC AACACCCGCT GACGCGCCCT
6361 GACGGGCTTG TCTGCTCCCG GCATCCGCTT ACAGACAAGC TGTGACCGTC TCCGGGAGCT
6421 GCATGTGTCA GAGGTTTTCA CCGTCATCAC CGAAACGCGC GAGGCAGCAG ATCAATTTCG
6481 GCGCGAAGGC GAAGCGGCAT GCATTTACGT TGACACCATC GAATGGTGCA AAACCTTTTCG
6541 CGGTATGGCA TGATAGCGCC CGGAAGAGAG TCAATTCAGG GTGGTGAATG TGAAACCAGT
6601 AACGTTATAC GATGTCGCAG AGTATGCCGG TGTCTCTTAT CAGACCGTTT CCCGCGTGGT
6661 GAACCAGGCC AGCCACGTTT CTGCGAAAAC GCGGGAAAAA GTGGAAGCGG CGATGGCGGA
6721 GCTGAATTAC ATTCCCAACC GCGTGGCACA ACAACTGGCG GGCAAACAGT CGTTGCTGAT
6781 TGGCGTTGCC ACCTCCAGTC TGGCCCTGCA CGCGCCGTCG CAAATTGTCTG CGGCGATTAA
6841 ATCTCGCGCC GATCAACTGG GTGCCAGCGT GGTGGTGTCTG ATGGTAGAAC GAAGCGGCGT
6901 CGAAGCCTGT AAAGCGGCGG TGCACAATCT TCTCGCGCAA CGCGTCAGTN GGGCTGATCA
6961 TTAA

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FIG.24D

pSPORT '+' (FOR SEQUENCING, PROBES, PHAGEMID)

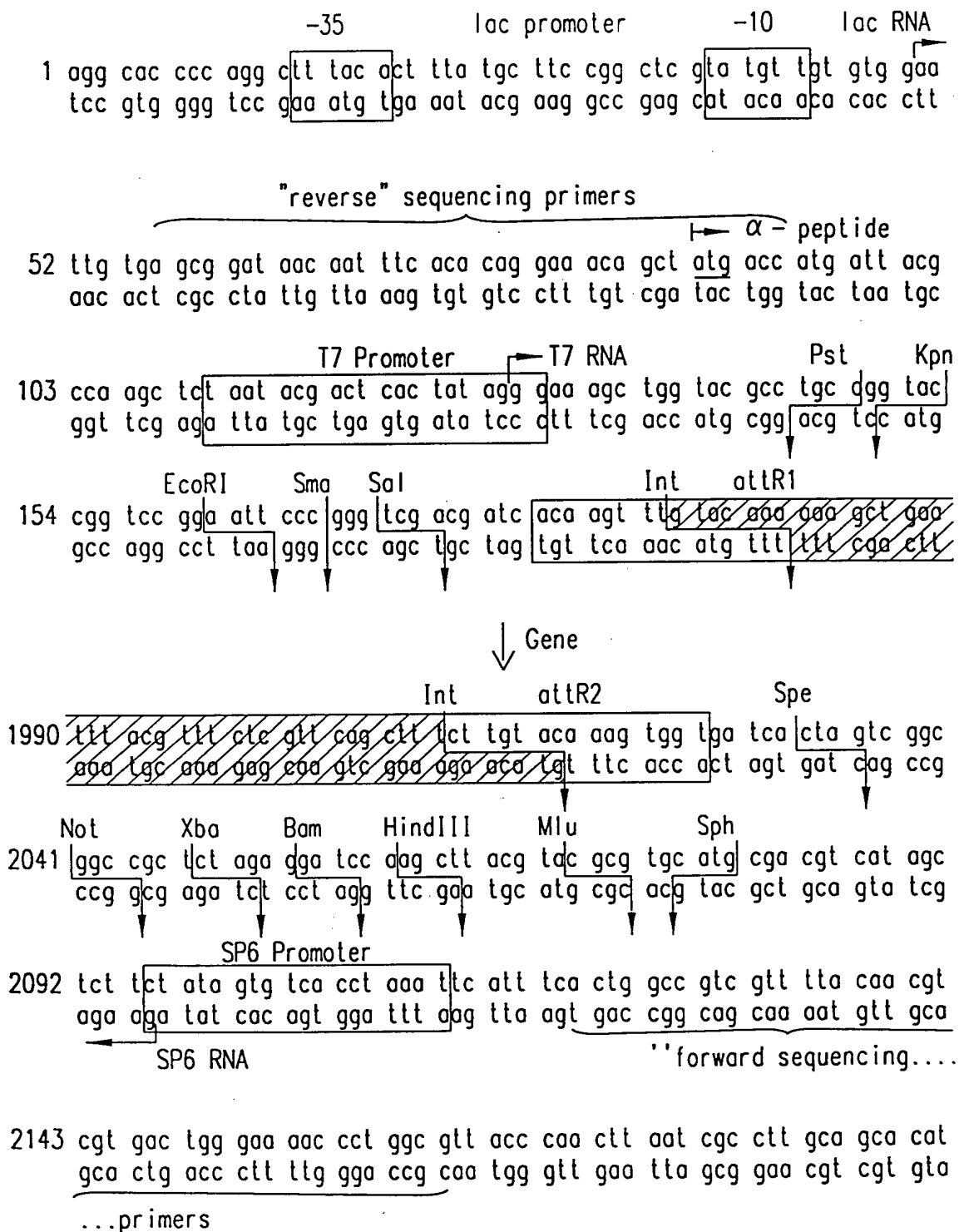


FIG.25A

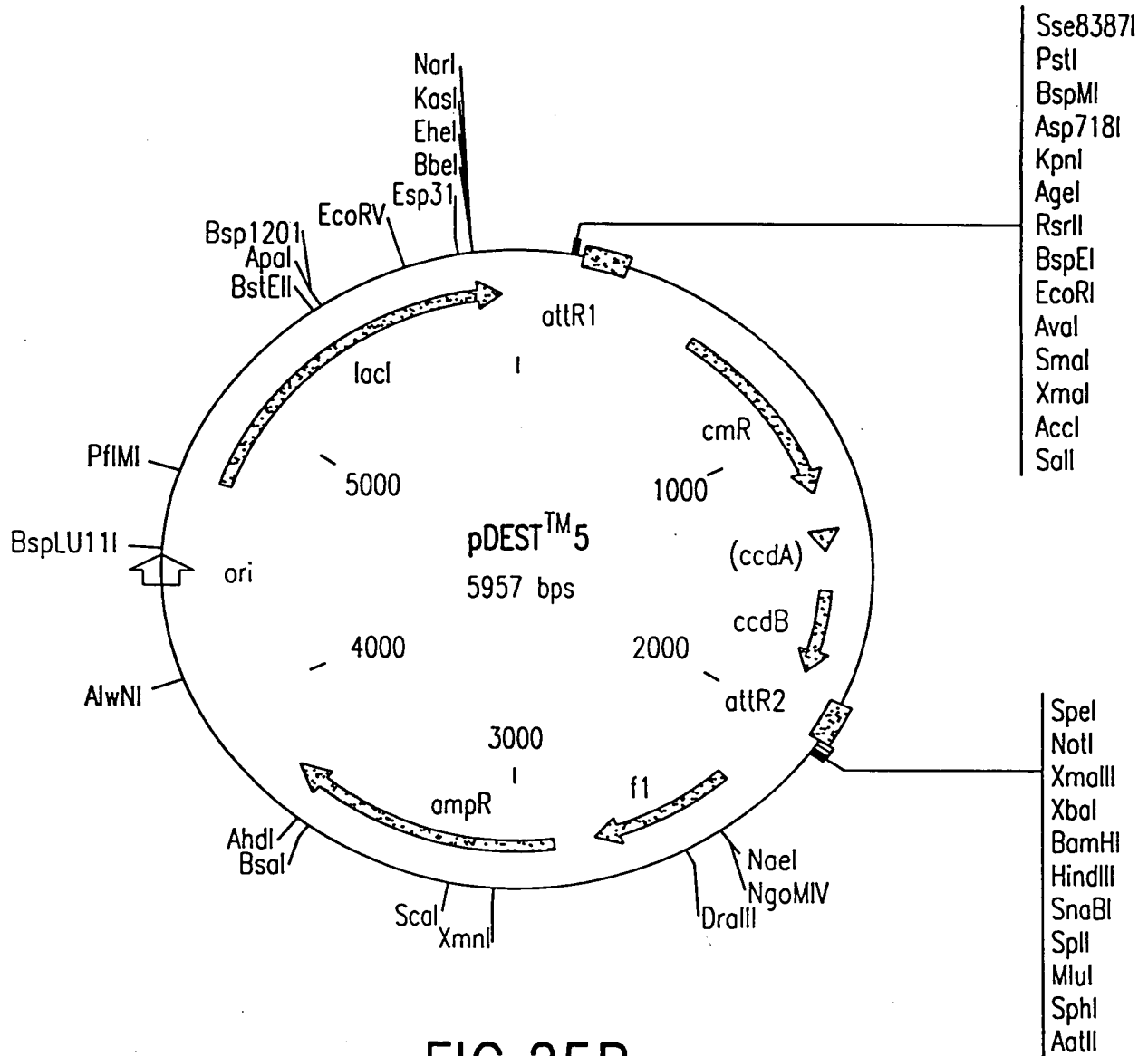


FIG.25B

pDEST5

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pDEST5 5957 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
305..181	attR1
555..1214	CmR
1334..1418	inactivated ccdA
1556..1861	ccdB
1902..2026	attR2
2278..2733	f1 (f1 intergenic region)
2865..3722	ampR
5378..5538	ori
4756..5922	lacI

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1 AGGCACCCCA GGCTTTACAC TTTATGCTTC CGGCTCGTAT GTTGTGTGGA ATTGTGAGCG
61 GATAACAATT TCACACAGGA AACAGCTATG ACCATGATTA CGCCAAGCTC TAATACGACT
121 CACTATAGGG AAAGCTGGTA CGCCTGCAGG TACCGGTCCG GAATTCCCGG GTCGACGATC
181 ACAAGTTTGT ACAAAAAAGC TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA
241 AATTAGATTT TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA
301 CTATGGCGGC CGCTAAGTTG GCAGCATCAC CCGACGCACT TTGCGCCGAA TAAATACCTG
361 TGACGGAAGA TCACTTCGCA GAATAAATAA ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC
421 CCTGGGCCAA CTTTTGGCGA AAATGAGACG TTGATCGGCA CGTAAGAGGT TCCAACTTTC
481 ACCATAATGA AATAAGATCA CTACCGGGCG TATTTTTTGA GTTATCGAGA TTTTCAGGAG
541 CTAAGGAAGC TAAAATGGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT
601 GGCATCGTAA AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA
661 CCGTTCAGCT GGATATTACG GCCTTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT
721 ATCCGGCCTT TATTCACATT CTTGCCCGCC TGATGAATGC TCATCCGGAA TTCCGTATGG
781 CAATGAAAGA CGGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC
841 ATGAGCAAAC TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT
901 TTCTACACAT ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA
961 AAGGGTTTAT TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAGTT
1021 TTGATTTAAA CGTGGCCAAT ATGGACAAC TCTTCGCCCC CGTTTTCCACC ATGGGCAAAT
1081 ATTATACGCA AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTTCAT CATGCCGTCT
1141 GTGATGGCTT CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC
1201 AGGGCGGGGC GTAAACGCGT GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT
1261 TGCGCGCTGA TTTTTCGGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA
1321 AAAGAGGTGT GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT
1381 GCTCAAGGCA TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAAATGAA
1441 GCCCGTCGTC TCGTGCCGA ACGCTGGAAA GCGGAAAATC AGGAAGGGAT GGCTGAGGTC
1501 GCCCGGTTTA TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA
1561 GTTTAAGGTT TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG
1621 TGATATTATT GACACGCCCG GCGACGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT
1681 GTCAGATAAA GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG
1741 CATGATGACC ACCGATATGG CCAGTGTGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA

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FIG.25C

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1801	TCTCAGCCAC	CGCGAAAATG	ACATCAAAAA	CGCCATTAAC	CTGATGTTCT	GGGGAATATA
1861	AATGTCAGGC	TCCCTTATAC	ACAGCCAGTC	TGCAGGTCGA	CCATAGTGAC	TGGATATGTT
1921	GTGTTTTACA	GTATTATGTA	GTCTGTTTTT	TATGCAAAAT	CTAATTTAAT	ATATTGATAT
1981	TTATATCATT	TTACGTTTCT	CGTTCAGCTT	TCTTGTACAA	AGTGGTGATC	ACTAGTCGGC
2041	GGCCGCTCTA	GAGGATCCAA	GCTTACGTAC	GCGTGCATGC	GACGTCATAG	CTCTTCTATA
2101	GTGTCACCTA	AATTCAATTC	ACTGGCCGTC	GTTTTACAAC	GTCGTGACTG	GGAAAACCCT
2161	GGCGTTACCC	AACTTAATCG	CCTTGCAGCA	CATCCCCCTT	TCGCCAGCTG	GCGTAATAGC
2221	GAAGAGGCC	GCACCGATCG	CCCTTCCCAA	CAGTTGCGCA	GCCTGAATGG	CGAATGGACG
2281	CGCCCTGTAG	CGGCGCATT	AGCGCGGCGG	GTGTGGTGGT	TACGCGCAGC	GTGACCGCTA
2341	CACTTGCCAG	CGCCCTAGCG	CCCGCTCCTT	TCGCTTTCTT	CCCTTCCTTT	CTCGCCACGT
2401	TCGCCGGCTT	TCCCGTCAA	GCTCTAAATC	GGGGGCTCCC	TTTAGGGTTC	CGATTTAGTG
2461	CTTTACGGCA	CCTCGACCCC	AAAAAACTTG	ATTAGGGTGA	TGGTTCACGT	AGTGGGCCAT
2521	CGCCCTGATA	GACGGTTTTT	CGCCCTTGA	CGTTGGAGTC	CACGTTCTTT	AATAGTGGAC
2581	TCTTGTTCCA	AACTGGAACA	AACTCAACC	CTATCTCGGT	CTATTCTTTT	GATTTATAAG
2641	GGATTTTGCC	GATTTGCGCC	TATTGGTTAA	AAAATGAGCT	GATTTAACAA	AAATTTAACG
2701	CGAATTTTAA	CAAAATATTA	ACGTTTACAA	TTTCAGGTGG	CACTTTTCGG	GGAAATGTGC
2761	GCGGAACCCC	TATTTGTTTA	TTTTTCTAAA	TACATTCAAA	TATGTATCCG	CTCATGAGAC
2821	AATAACCCTG	ATAAATGCTT	CAATAATATT	GAAAAAGGAA	GAGTATGAGT	ATTCAACATT
2881	TCCGTGTCGC	CCTTATTCCC	TTTTTTGCGG	CATTTTGCCT	TCCTGTTTTT	GCTCACCAG
2941	AAACGCTGGT	GAAAGTAAAA	GATGCTGAAG	ATCAGTTGGG	TGCACGAGTG	GGTTACATCG
3001	AACTGGATCT	CAACAGCGGT	AAGATCCTTG	AGAGTTTTCG	CCCCGAAGAA	CGTTTTCCAA
3061	TGATGAGCAC	TTTTAAAGTT	CTGCTATGTG	GCGCGGTATT	ATCCCGTATT	GACGCCGGGC
3121	AAGAGCAACT	CGGTCGCCGC	ATACACTATT	CTCAGAATGA	CTTGTTGAG	TACTCACCAG
3181	TCACAGAAAA	GCATCTTACG	GATGGCATGA	CAGTAAGAGA	ATTATGCAGT	GCTGCCATAA
3241	CCATGAGTGA	TAACACTGCG	GCCAACTTAC	TTCTGACAAC	GATCGGAGGA	CCGAAGGAGC
3301	TAACCGCTTT	TTTGACAAC	ATGGGGGATC	ATGTAACTCG	CCTTGATCGT	TGGGAACCGG
3361	AGCTGAATGA	AGCCATACCA	AACGACGAGC	GTGACACCAC	GATGCCTGTA	GCAATGGCAA
3421	CAACGTTGCG	CAAACTATTA	ACTGGCGAAC	TACTTACTCT	AGCTTCCCGG	CAACAATTAA
3481	TAGACTGGAT	GGAGGCGGAT	AAAGTTGCAG	GACCACTTCT	GCGCTCGGCC	CTTCCGGCTG
3541	GCTGGTTTAT	TGCTGATAAA	TCTGGAGCCG	GTGAGCGTGG	GTCTCGCGGT	ATCATTGCAG
3601	CACTGGGGCC	AGATGGTAAG	CCCTCCCGTA	TCGTAGTTAT	CTACACGACG	GGGAGTCAGG
3661	CAACTATGGA	TGAACGAAAT	AGACAGATCG	CTGAGATAGG	TGCCTCACTG	ATTAAGCATT
3721	GGTAACTGTC	AGACCAAGTT	TACTCATATA	TACTTTAGAT	TGATTTAAAA	CTTCATTTTT
3781	AATTTAAAAG	GATCTAGGTG	AAGATCCTTT	TTGATAATCT	CATGACCAAA	ATCCCTTAAC
3841	GTGAGTTTTT	GTTCCACTGA	GCGTCAGACC	CCGTAGAAAA	GATCAAAGGA	TCTTCTTGAG
3901	ATCCTTTTTT	TCTGCGCGTA	ATCTGCTGCT	TGCAAACAAA	AAAACCACCG	CTACCAGCGG
3961	TGGTTTGTTT	GCCGGATCAA	GAGCTACCAA	CTCTTTTTCC	GAAGGTAAC	GGCTTCAGCA
4021	GAGCGCAGAT	ACCAAATACT	GTCCTTCTAG	TGTAGCCGTA	GTTAGGCCAC	CACTTCAAGA
4081	ACTCTGTAGC	ACCGCCTACA	TACCTCGCTC	TGCTAATCCT	GTTACCAGTG	GCTGCTGCCA
4141	GTGGCGATAA	GTCGTGTCTT	ACCGGGTTGG	ACTCAAGACG	ATAGTTACCG	GATAAGGCGC
4201	AGCGGTCGGG	CTGAACGGGG	GGTTCGTGCA	CACAGCCCAG	CTTGAGCGA	ACGACCTACA

FIG.25D

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4261 CCGAACTGAG ATACCTACAG CGTGAGCATT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA
4321 AGGCGGACAG GTATCCGGTA AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC
4381 CAGGGGGAAA CGCCTGGTAT CTTTATAGTC CTGTCGGGTT TCGCCACCTC TGACTTGAGC
4441 GTCGATTTTT GTGATGCTCG TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG
4501 CCTTTTTACG GTTCCTGGCC TTTTGCTGGC CTTTTGCTCA CATGTTCTTT CCTGCGTTAT
4561 CCCCTGATTC TGTGGATAAC CGTATTACCG CCTTTGAGTG AGCTGATACC GCTCGCCGCA
4621 GCCGAACGAC CGAGCGCAGC GAGTCAGTGA GCGAGGAAGC GGAAGAGCGC CCAATACGCA
4681 AACCGCCTCT CCGCGCGCGT TGGCCGATTC ATTAATGCAG AGCTTGCAAT TCGCGCGCGA
4741 AGGCGAAGCG GCATTTACGT TGACACCATC GAATGGCGCA AAACCTTTCG CGGTATGGCA
4801 TGATAGCGCC CGGAAGAGAG TCAATTCAGG GTGGTGAATG TGAAACCAGT AACGTTATAC
4861 GATGTCGCAG AGTATGCCGG TGTCTCTTAT CAGACCGTTT CCCGCGTGGT GAACCAGGCC
4921 AGCCACGTTT CTGCGAAAAC GCGGGAAAAA GTGGAAGCGG CGATGGCGGA GCTGAATTAC
4981 ATTCCCAACC GCGTGGCACA ACAACTGGCG GGCAAACAGT CGTTGCTGAT TGGCGTTGCC
5041 ACCTCCAGTC TGGCCCTGCA CGCGCCGTCG CAAATTGTCT CGGCGATTAA ATCTCGCGCC
5101 GATCAACTGG GTGCCAGCGT GGTGGTGTCT ATGGTAGAAC GAAGCGGCGT CGAAGCCTGT
5161 AAAGCGGCGG TGCACAATCT TCTCGCGCAA CGGGTCAGTG GGCTGATCAT TAACTATCCG
5221 CTGGATGACC AGGATGCCAT TGCTGTGGAA GCTGCCTGCA CTAATGTTCC GGC GTTATTT
5281 CTTGATGTCT CTGACCAGAC ACCCATCAAC AGTATTATTT TCTCCCATGA AGACGGTACG
5341 C GACTGGGCG TGGAGCATCT GGTCGCATTG GGTCACCAGC AAATCGCGCT GTTAGCGGGC
5401 CCATTAAGTT CTGTCTCGGC GCGTCTGCGT CTGGCTGGCT GGCATAAATA TCTACTCGC
5461 AATCAAATTC AGCCGATAGC GGAACGGGAA GCGGACTGGA GTGCCATGTC CGGTTTTCAA
5521 CAAACCATGC AAATGCTGAA TGAGGGCATC GTTCCCACTG CGATGCTGGT TGCCAACGAT
5581 CAGATGGCGC TGGGCGCAAT GCGCGCCATT ACCGAGTCCG GGCTGCGCGT TGGTGCGGAT
5641 ATCTCGGTAG TGGGATACGA CGATACCGAA GACAGCTCAT GTTATATCCC GCCGTCAACC
5701 ACCATCAAAC AGGATTTTCG CCTGCTGGGG CAAACCAGCG TGGACCGCTT GCTGCAACTC
5761 TCTCAGGGCC AGGCGGTGAA GGGCAATCAG CTGTTGCCCG TCTCACTGGT GAAAAGAAAA
5821 ACCACCCTGG CGCCCAATAC GCAAACCGCC TCTCCCCGCG CGTTGGCCGA TTCATTAATG
5881 CAGCTGGCAC GACAGGTTTC CCGACTGGAA AGCGGGCAGT GAGCGCAACG CAATTAATGT
5941 GAGTTAGCTC ACTCATT

FIG.25E

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pSPORT "-" (OPPOSITE STRAND)

"FORWARD" SEQUENCING PRIMERS

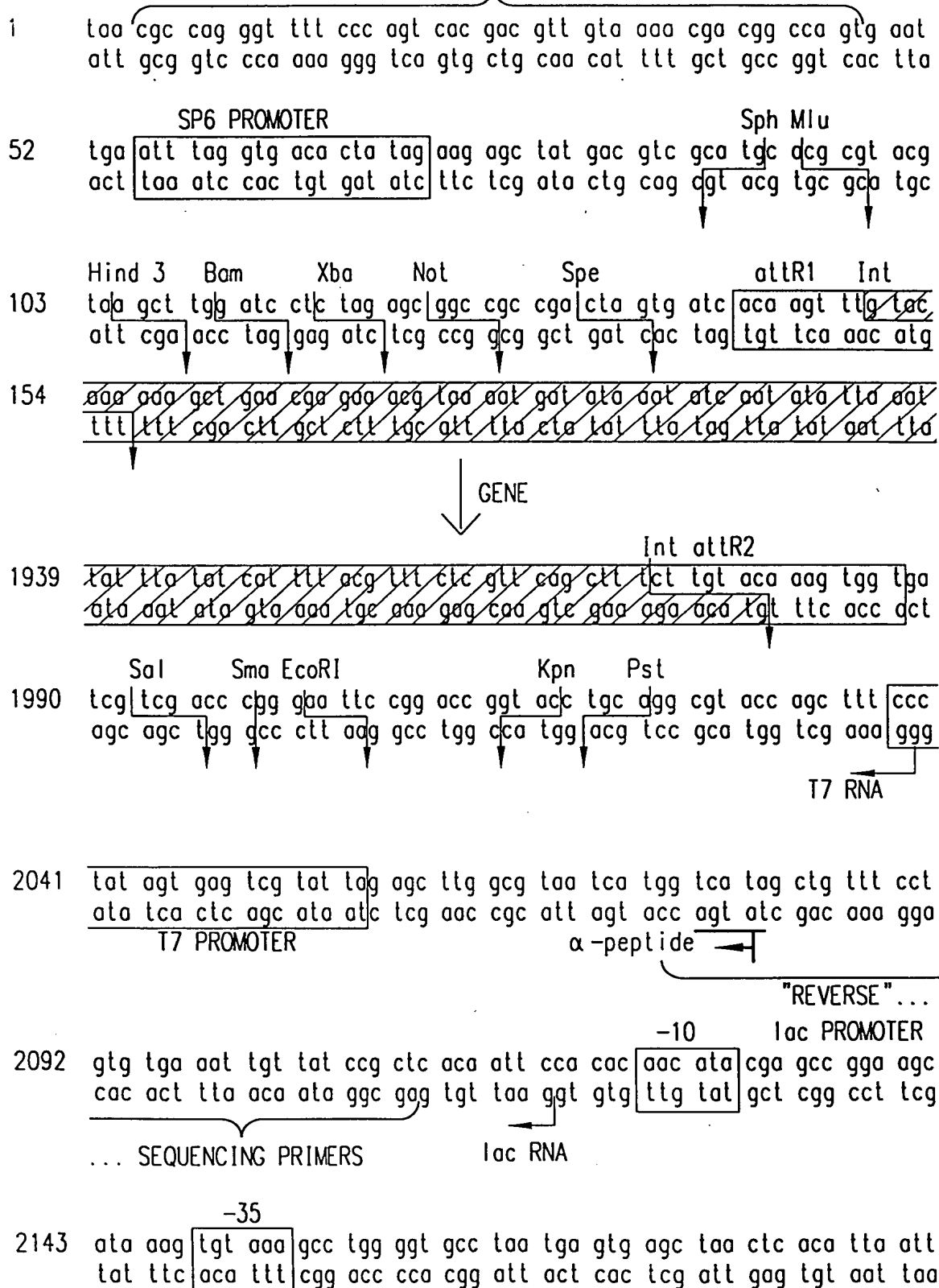


FIG.26A

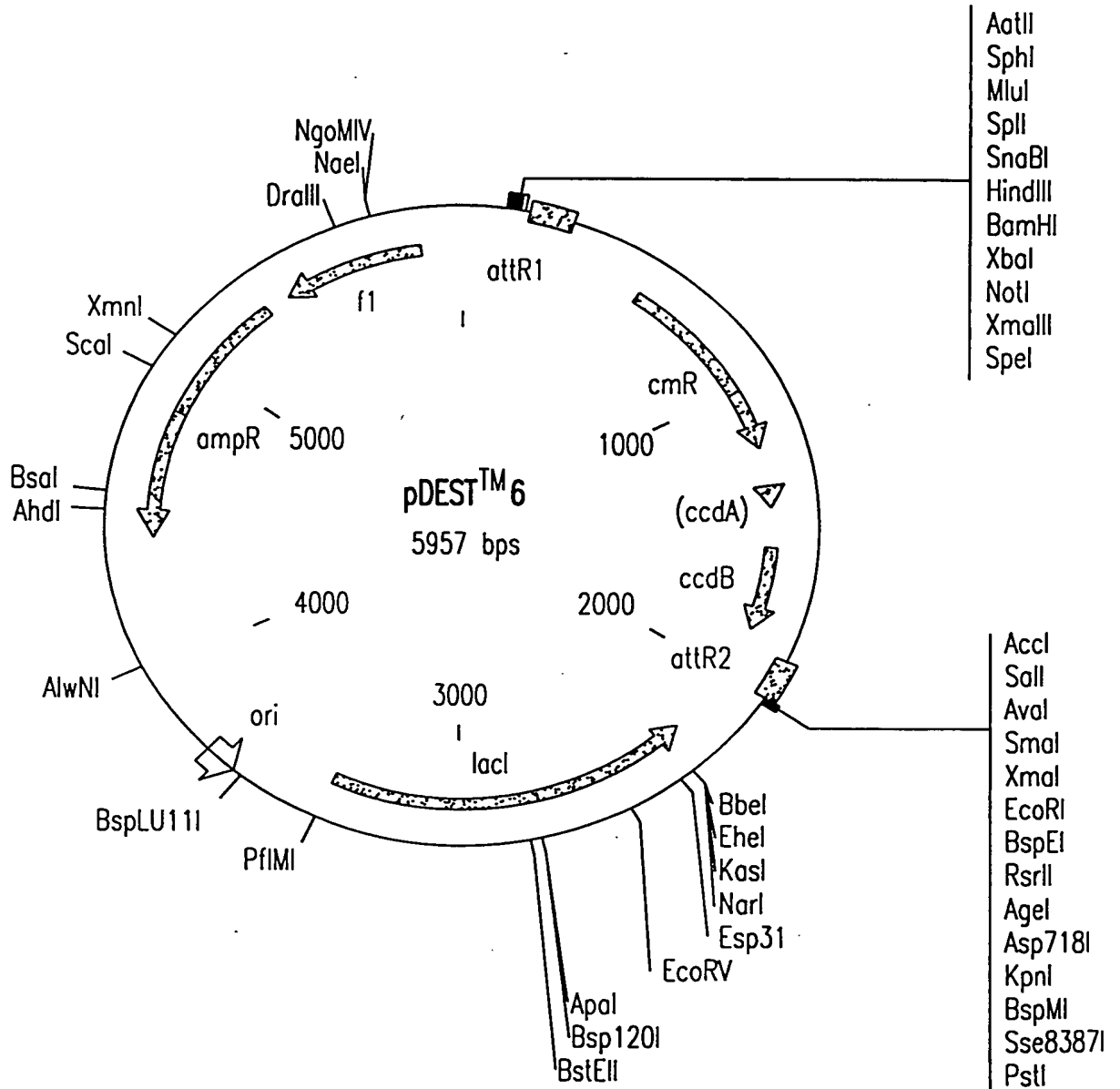


FIG.26B

pDEST6

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pDEST6 5957 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
266..142	attR1
516..1175	CmR
1295..1379	inactivated ccdA
1517..1822	ccdB
1863..1987	attR2
2203..3369	lacI
4403..5260	ampR
5392..5847	f1 (f1 intergenic region)

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1 TAACGCCAGG GTTTTCCCAG TCACGACGTT GTAAACGAC GGCCAGTGAA TTGAATTTAG
61 GTGACACTAT AGAAGAGCTA TGACGTCGCA TGCACGCGTA CGTAAGCTTG GATCCTCTAG
121 AGCGGCCGCC GACTAGTGAT CACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAT
181 GATATAAATA TCAATATATT AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT
241 AAAACACAAC ATATCCAGTC ACTATGGCGG CCGCTAAGTT GGCAGCATCA CCCGACGCAC
301 TTTGCGCCGA ATAAATACCT GTGACGGAAG ATCACTTCGC AGAATAAATA AATCCTGGTG
361 TCCCTGTTGA TACCGGGAAG CCCTGGGCCA ACTTTTGGCG AAAATGAGAC GTTGATCGGC
421 ACGTAAGAGG TTCCAACTTT CACCATAATG AAATAAGATC ACTACCGGGC GTATTTTTTG
481 AGTTATCGAG ATTTTCAGGA GCTAAGGAAG CTAAATGGA GAAAAAATC ACTGGATATA
541 CCACCGTTGA TATATCCCAA TGGCATCGTA AAGAACATTT TGAGGCATTT CAGTCAGTTG
601 CTCAATGTAC CTATAACCAG ACCGTTTCAGC TGGATATTAC GGCTTTTTTA AAGACCGTAA
661 AGAAAAATAA GCACAAGTTT TATCCGGCCT TTATTCACAT TCTTGCCCGC CTGATGAATG
721 CTCATCCGGA ATTCCGTATG GCAATGAAAG ACGGTGAGCT GGTGATATGG GATAGTGTTC
781 ACCCTTGTTA CACCGTTTTT CATGAGCAAA CTGAAACGTT TTCATCGCTC TGGAGTGAAT
841 ACCACGACGA TTTCCGGCAG TTTCTACACA TATATTCGCA AGATGTGGCG TGTTACGGTG
901 AAAACCTGGC CTATTTCCCT AAAGGGTTTA TTGAGAATAT GTTTTTTCGC TCAGCCAATC
961 CCTGGGTGAG TTTCACCAAG TTTGATTTAA ACGTGGCCAA TATGGACAAC TTCTTCGCCC
1021 CCGTTTTTAC CATGGGCAAA TATTATACGC AAGGCGACAA GGTGCTGATG CCGCTGGCGA
1081 TTCAGGTTCA TCATGCCGTC TGTGATGGCT TCCATGTCGG CAGAATGCTT AATGAATTAC
1141 AACAGTACTG CGATGAGTGG CAGGGCGGGG CGTAAACGCG TGGATCCGGC TTAATAAAAG
1201 CCAGATAACA GTATGCGTAT TTGCGCGCTG ATTTTTCGGG TATAAGAATA TATACTGATA
1261 TGTATACCCG AAGTATGTCA AAAAGAGGTG TGCTATGAAG CAGCGTATTA CAGTGACAGT
1321 TGACAGCGAC AGCTATCAGT TGCTCAAGGC ATATATGATG TCAATATCTC CGGTCTGGTA
1381 AGCACAACCA TGCAGAAATG AGCCCGTCGT CTGCGTGCCG AACGCTGGAA AGCGGAAAAT
1441 CAGGAAGGGA TGGCTGAGGT CGCCCGGTTT ATTGAAATGA ACGGCTCTTT TGCTGACGAG
1501 AACAGGGACT GGTGAAATGC AGTTTAAGGT TTACACCTAT AAAAGAGAGA GCCGTTATCG
1561 TCTGTTTGTG GATGTACAGA GTGATATTAT TGACACGCCG GGGCGACGGA TGGTGATCCC
1621 CCTGGCCAGT GCACGTCTGC TGTCAGATAA AGTCTCCCGT GAACTTTACC CGGTGGTGCA
1681 TATCGGGGAT GAAAGCTGGC GCATGATGAC CACCGATATG GCCAGTGTGC CGGTCTCCGT
1741 TATCGGGGAA GAAGTGGCTG ATCTCAGCCA CCGCGAAAAT GACATCAAAA ACGCCATTAA
1801 CCTGATGTTC TGGGGAATAT AAATGTCAGG CTCCCTTATA CACAGCCAGT CTGCAGGTCG

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FIG.26C

1861	ACCATAGTGA	CTGGATATGT	TGTGTTTTAC	AGTATTATGT	AGTCTGTTTT	TTATGCAAAA
1921	TCTAATTTAA	TATATTGATA	TTTATATCAT	TTTACGTTTC	TCGTTTCAGCT	TTCTTGTACA
1981	AAGTGGTGAT	CGTCGACCCG	GGAATTCCGG	ACCGGTACCT	GCAGGCGTAC	CAGCTTTCCC
2041	TATAGTGAGT	CGTATTAGAG	CTTGCGGTAA	TCATGGTCAT	AGCTGTTTCC	TGTGTGAAAT
2101	TGTTATCCGC	TCACAATTCC	ACACAACATA	CGAGCCGGAA	GCATAAAGTG	TAAAGCCTGG
2161	GGTGCCTAAT	GAGTGAGCTA	ACTCACATTA	ATTGCGTTGC	GCTCACTGCC	CGCTTTCCAG
2221	TCGGGAAACC	TGTCGTGCCA	GCTGCATTAA	TGAATCGGCC	AACGCGCGGG	GAGAGGCGGT
2281	TTGCGTATTG	GGCGCCAGGG	TGGTTTTTCT	TTTCACCAGT	GAGACGGGCA	ACAGCTGATT
2341	GCCCTTCACC	GCCTGGCCCT	GAGAGAGTTG	CAGCAAGCGG	TCCACGCTGG	TTTGCCCCAG
2401	CAGGCGAAAA	TCCTGTTTGA	TGGTGGTTGA	CGGCGGGATA	TAACATGAGC	TGTCTTCGGT
2461	ATCGTCGTAT	CCCACTACCG	AGATATCCGC	ACCAACGCGC	AGCCCGGACT	CGGTAATGGC
2521	GCGCATTGCG	CCCAGCGCCA	TCTGATCGTT	GGCAACCAGC	ATCGCAGTGG	GAACGATGCC
2581	CTCATTCAGC	ATTTGCATGG	TTTGTTGAAA	ACCGGACATG	GCACTCCAGT	CGCCTTCCCC
2641	TTCCGCTATC	GGCTGAATTT	GATTGCGAGT	GAGATATTTA	TGCCAGCCAG	CCAGACGCAG
2701	ACGCGCCGAG	ACAGAACTTA	ATGGGCCCGC	TAACAGCGCG	ATTTGCTGGT	GACCCAATGC
2761	GACCAGATGC	TCCACGCCCA	GTCGCGTACC	GTCTTCATGG	GAGAAAATAA	TACTGTTGAT
2821	GGGTGTCTGG	TCAGAGACAT	CAAGAAATAA	CGCCGGAACA	TTAGTGCAAG	CAGCTTCCAC
2881	AGCAATGGCA	TCCTGGTCAT	CCAGCGGATA	GTTAATGATC	AGCCCACTGA	CCCGTTGCGC
2941	GAGAAGATTG	TGCACCGCCG	CTTTACAGGC	TTCGACGCCG	CTTCGTTCTA	CCATCGACAC
3001	CACCACGCTG	GCACCCAGTT	GATCGGCGCG	AGATTTAATC	GCCGCGACAA	TTTGCGACGG
3061	CGCGTGCAGG	GCCAGACTGG	AGGTGGCAAC	GCCAATCAGC	AACGACTGTT	TGCCCGCCAG
3121	TTGTTGTGCC	ACGCGGTTGG	GAATGTAATT	CAGCTCCGCC	ATCGCCGCTT	CCACTTTTTTC
3181	CCGCGTTTTC	GCAGAAACGT	GGCTGGCCTG	GTTCACCACG	CGGGAAACGG	TCTGATAAGA
3241	GACACCGGCA	TACTCTGCGA	CATCGTATAA	CGTTACTGGT	TTCACATTCA	CCACCCTGAA
3301	TTGACTCTCT	TCCGGGCGCT	ATCATGCCAT	ACCGCGAAAG	GTTTTGCGCC	ATTCGATGGT
3361	GTCAACGTAA	ATGCCGCTTC	GCCTTCGCGC	GCGAATTGCA	AGCTCTGCAT	TAATGAATCG
3421	GCCAACGCGC	GGGGAGAGGC	GGTTTGCGTA	TTGGGCGCTC	TTCCGCTTCC	TCGCTCACTG
3481	ACTCGCTGCG	CTCGGTCGTT	CGGCTGCGGC	GAGCGGTATC	AGCTCACTCA	AAGGCGGTAA
3541	TACGGTTATC	CACAGAATCA	GGGGATAACG	CAGGAAAGAA	CATGTGAGCA	AAAGGCCAGC
3601	AAAAGGCCAG	GAACCGTAAA	AAGGCCGCGT	TGCTGGCGTT	TTTCCATAGG	CTCCGCCCCC
3661	CTGACGAGCA	TCACAAAAAT	CGACGCTCAA	GTCAGAGGTG	GCGAAACCCG	ACAGGACTAT
3721	AAAGATACCA	GGCGTTTCCC	CCTGGAAGCT	CCCTCGTGCG	CTCTCCTGTT	CCGACCCTGC
3781	CGCTTACCGG	ATACCTGTCC	GCCTTTCTCC	CTTCGGGAAG	CGTGGCGCTT	TCTCAATGCT
3841	CACGCTGTAG	GTATCTCAGT	TCGGTGTAGG	TCGTTGCTC	CAAGCTGGGC	TGTGTGCACG
3901	AACCCCCCGT	TCAGCCCGAC	CGCTGCGCCT	TATCCGGTAA	CTATCGTCTT	GAGTCCAACC
3961	CGGTAAGACA	CGACTTATCG	CCACTGGCAG	CAGCCACTGG	TAACAGGATT	AGCAGAGCGA
4021	GGTATGTAGG	CGGTGCTACA	GAGTTCTTGA	AGTGGTGGCC	TAACACGGC	TACACTAGAA
4081	GGACAGTATT	TGGTATCTGC	GCTCTGCTGA	AGCCAGTTAC	CTTCGGAAAA	AGAGTTGGTA
4141	GCTCTTGATC	CGGCAAACAA	ACCACCGCTG	GTAGCGGTGG	TTTTTTTGT	TGCAAGCAGC
4201	AGATTACGCG	CAGAAAAAAA	GGATCTCAAG	AAGATCCTTT	GATCTTTTCT	ACGGGGTCTG
4261	ACGCTCAGTG	GAACGAAAAC	TCACGTTAAG	GGATTTTGGT	CATGAGATTA	TCAAAAAGGA

FIG.26D

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4321 TCTTCACCTA GATCCTTTTA AATTA AAAAT GAAGTTTAA ATCAATCTAA AGTATATATG
4381 AGTAAACTTG GTCTGACAGT TACCAATGCT TAATCAGTGA GGCACCTATC TCAGCGATCT
4441 GTCTATTTTCG TTCATCCATA GTTGCTGAC TCCCGTCGT GTAGATAACT ACGATACGGG
4501 AGGGCTTACC ATCTGGCCCC AGTGCTGCAA TGATACCGCG AGACCCACGC TCACCGGCTC
4561 CAGATTTATC AGCAATAAAC CAGCCAGCCG GAAGGGCCGA GCGCAGAAGT GGTCTGCAA
4621 CTTTATCCGC CTCCATCCAG TCTATTAATT GTTGCCGGA AGCTAGAGTA AGTAGTTCGC
4681 CAGTTAATAG TTTGCGCAAC GTTGTTGCCA TTGCTACAGG CATCGTGGTG TCACGCTCGT
4741 CGTTTGGTAT GGCTTCATTC AGTCCGGTT CCAACGATC AAGGCGAGTT ACATGATCCC
4801 CCATGTTGTG CAAAAAGCG GTTAGCTCCT TCGGTCCTCC GATCGTTGTC AGAAGTAAGT
4861 TGGCCGCAGT GTTATCACTC ATGGTTATGG CAGCACTGCA TAATTCTCTT ACTGTCATGC
4921 CATCCGTAAG ATGCTTTTCT GTGACTGGTG AGTACTCAAC CAAGTCATTC TGAGAATAGT
4981 GTATGCGGCG ACCGAGTTGC TCTTGCCCGG CGTCAATACG GGATAATACC GCGCCACATA
5041 GCAGAACTTT AAAAGTGCTC ATCATTGGAA AACGTTCTTC GGGGCGAAAA CTCTCAAGGA
5101 TCTTACCGCT GTTGAGATCC AGTTCGATGT AACCCTCG TGCACCCAAC TGATCTTCAG
5161 CATCTTTTAC TTTACCAGC GTTTCTGGGT GAGCAAAAC AGGAAGGCAA AATGCCGCAA
5221 AAAAGGGAAT AAGGGCGACA CGGAAATGTT GAATACTCAT ACTCTTCCTT TTTCAATATT
5281 ATTGAAGCAT TTATCAGGGT TATTGTCTCA TGAGCGGATA CATATTTGAA TGTATTTAGA
5341 AAAATAAACA AATAGGGGT CCGCGCACAT TTCCCGAAA AGTGCCACCT GAAATTGTAA
5401 ACGTTAATAT TTTGTTAAAA TTCGCGTTAA ATTTTGTTA AATCAGCTCA TTTTTTAACC
5461 AATAGGCCGA AATCGGCAA ATCCCTTA AATCAAAGA ATAGACCGAG ATAGGGTTGA
5521 GTGTTGTTCC AGTTTGGAAC AAGAGTCCAC TATTAAAGAA CGTGGACTCC AACGTCAAAG
5581 GGCGAAAAAC CGTCTATCAG GCGATGGCC CACTACGTGA ACCATCACC TAATCAAGTT
5641 TTTTGGGGTC GAGGTGCCGT AAAGCACTAA ATCGGAACCC TAAAGGGAGC CCGGATTTA
5701 GAGCTTGACG GGGAAAGCCG GCGAACGTGG CGAGAAAGGA AGGGAAGAAA GCGAAAGGAG
5761 CGGGCGCTAG GCGCTGGCA AGTGTAGCGG TCACGCTGCG CGTAACCACC ACACCGCCG
5821 CGCTTAATGC GCCGCTACAG GCGCGTCCA TTCGCCATTC AGGCTGCGCA ACTGTTGGGA
5881 AGGGCGATCG GTGCGGGCCT CTTGCTATT ACGCCAGCTG GCGAAAGGGG GATGTGCTGC
5941 AAGGCGATTA AGTTGGG

FIG.26E

CMV PROMOTER FOR EUKARYOTIC EXPRESSION

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970 cca ttg acg caa atg ggc ggt agg cgt gla cgg tgg gag glc tat ata agc
ggt aac tgc gtt tac ccg cca tcc gca cat gcc acc ctc cag ata tat tgc

1021 aga gct cgt tta gtg aac cgt ^{mRNA START} cag atc gcc tgg aga cgc cat cca cgc tgt
tct cga gca aat cac ttg gca glc tag cgg acc tct gcg gla ggt gcg aca

CMV ENHANCER/PROMOTER

1072 ttt gac ctc cat aga aga cac cgg gac cga tcc agc ctc cgg act cta gcc
aaa ctg gag gla tct tct gtg gcc ctg gct agg tgc gag gac tga gat cgg

1123 tag gcc gcg gag cgg ata aca att tca cac agg aaa cag cta tga cca cta
atc cgg cgc ctc gcc tat tgt taa agt gtg tcc ttt glc gat act ggt gat

1174 ggc ttt tgc aaa aag cta ttt agg tga cac tat aga agg tac gcc tgc dgg ^{Pst}
ccg aaa acg ttt ttc gat aaa tcc act gtg ata tct tcc atg cgg acg tcc

1225 ^{Kpn} ^{EcoRI} ^{Int} ^{attR1}
tac cgg tcc gga att ccc atc aca agt ttg tgc aga aag gct gaa cga gaa
atg gcc agg cct taa ggg tag tgt tca aac atg ttt ttt cga ctt gct ett

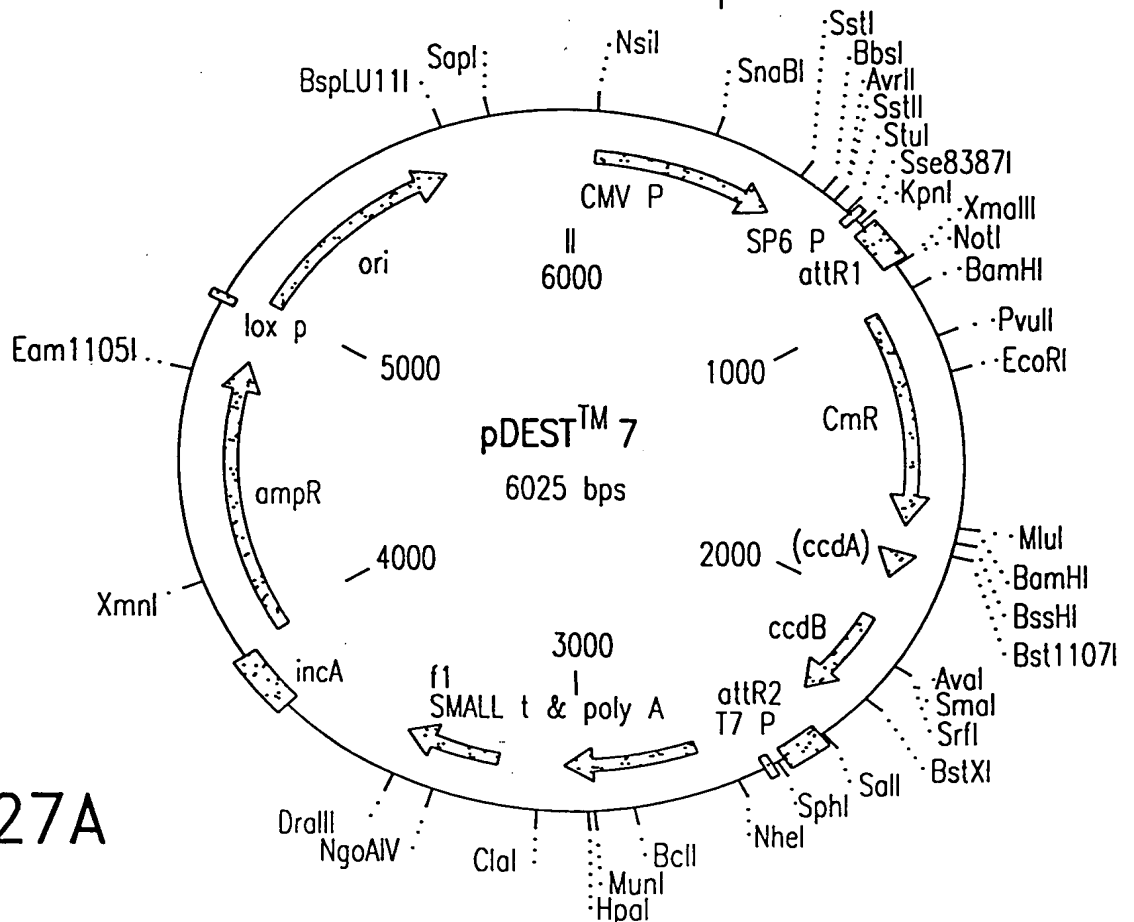


FIG.27A

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pDEST7 6025 bp (rotated to position 2800)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..589	CMV promoter
906..782	attR1
1015..1674	CmR
1794..1878	inactivated ccdA
2016..2321	ccdB
2362..2486	attR2
2671..3033	small t & polyA
3227..3502	f1
3962..4822	ampR
5022..5661	ori

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1  ATTATCATGA CATTAACTTA TAAAAATAGG CGTAGTACGA GGCCCTTTCA CTCATTAGAT
61 GCATGTCGTT ACATAACTTA CGGTAAATGG CCCGCCTGGC TGACCGCCCA ACGACCCCCG
121 CCCATTGACG TCAATAATGA CGTATGTTCC CATAGTAACG CCAATAGGGA CTTTCCATTG
181 ACGTCAATGG GTGGAGTATT TACGGTAAAC TGCCCACTTG GCAGTACATC AAGTGTATCA
241 TATGCCAAGT ACGCCCCCTA TTGACGTCAA TGACGGTAAA TGGCCCGCCT GGCATTATGC
301 CCAGTACATG ACCTTATGGG ACTTTCCTAC TTGGCAGTAC ATCTACGTAT TAGTCATCGC
361 TATTACCATG GTGATGCGGT TTTGGCAGTA CATCAATGGG CGTGGATAGC GGTTTGACTC
421 ACGGGGATTT CCAAGTCTCC ACCCCATTGA CGTCAATGGG AGTTTGTITT GGCACCAAAA
481 TCAACGGGAC TTTCCAAAAT GTCGTAACAA CTCCGCCCCA TTGACGCAAA TGGGCGGTAG
541 GCGTGTACGG TGGGAGGTCT ATATAAGCAG AGCTCGTTTA GTGAACCGTC AGATCGCCTG
601 GAGACGCCAT CCACGCTGTT TTGACCTCCA TAGAAGACAC CGGGACCGAT CCAGCCTCCG
661 GACTCTAGCC TAGGCCGCGG AGCGGATAAC AATTTCACAC AGGAAACAGC TATGACCATT
721 AGGCCTTTGC AAAAAGCTAT TTAGGTGACA CTATAGAAGG TACGCCTGCA GGTACCGGAT
781 CACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAT GATATAAATA TCAATATATT
841 AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT AAACACAAC ATATCCAGTC
901 ACTATGGCGG CCGCATTAGG CACCCAGGC TTTACACTTT ATGCTTCCGG CTCGTATAAT
961 GTGTGGATTT TGAGTTAGGA TCCGTCGAGA TTTTCAGGAG CTAAGGAAGC TAAAATGGAG
1021 AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA AGAACATTTT
1081 GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT GGATATTACG
1141 GCCTTTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT ATCCGGCCTT TATTCACATT
1201 CTTGCCCCGCC TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA CGGTGAGCTG
1261 GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC ATGAGCAAAC TGAAACGTTT
1321 TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT ATATTCGCAA
1381 GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT TGAGAATATG
1441 TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAATT TTGATTTAAA CGTGGCCAAT
1501 ATGGACAAC TCTTCGCCCC CGTTTTTACC ATGGGCAAAT ATTATACGCA AGGCGACAAG
1561 GTGCTGATGC CGCTGGCGAT TCAGGTTTAT CATGCCGTCT GTGATGGCTT CCATGTCGGC
1621 AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC GTAAACGCGT
1681 GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT TGC GCGCTGA TTTTGTGGT

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FIG.27B

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1741	ATAAGAATAT	ATACTGATAT	GTATACCCGA	AGTATGTCAA	AAAGAGGTGT	GCTATGAAGC
1801	AGCGTATTAC	AGTGACAGTT	GACAGCGACA	GCTATCAGTT	GCTCAAGGCA	TATATGATGT
1861	CAATATCTCC	GGTCTGGTAA	GCACAACCAT	GCAGAATGAA	GCCCGTCGTC	TGCGTGCCGA
1921	ACGCTGGAAA	GCGGAAAATC	AGGAAGGGAT	GGCTGAGGTC	GCCCGGTTTA	TTGAAATGAA
1981	CGGCTCTTTT	GCTGACGAGA	ACAGGGACTG	GTGAAATGCA	GTTTAAGGTT	TACACCTATA
2041	AAAGAGAGAG	CCGTTATCGT	CTGTTTGTGG	ATGTACAGAG	TGATATTATT	GACACGCCCG
2101	GGCGACGGAT	GGTGATCCCC	CTGGCCAGTG	CACGTCTGCT	GTCAGATAAA	GTCTCCCGTG
2161	AACTTTACCC	GGTGGTGCAT	ATCGGGGATG	AAAGCTGGCG	CATGATGACC	ACCGATATGG
2221	CCAGTGTGCC	GGTCTCCGTT	ATCGGGGAAG	AAGTGGCTGA	TCTCAGCCAC	CGCGAAAATG
2281	ACATCAAAAA	CGCCATTAAC	CTGATGTTCT	GGGGAATATA	AATGTCAGGC	TCCCTTATAC
2341	ACAGCCAGTC	TGCAGGTGCA	CCATAGTGAC	TGGATATGTT	GTGTTTTACA	GTATTATGTA
2401	GTCTGTTTTT	TATGCAAAAT	CTAATTTAAT	ATATTGATAT	TTATATCATT	TTACGTTTCT
2461	CGTTCAGCTT	TCTTGTACAA	AGTGGTGATC	GCGTGCATGC	GACGTCATAG	CTCTCTCCCT
2521	ATAGTGAGTC	GTATTATAAG	CTAGGCACTG	GCCGTCGTTT	TACAACGTCG	TGACTGGGAA
2581	AACTGCTAGC	TTGGGATCTT	TGTGAAGGAA	CCTTACTTCT	GTGGTGTGAC	ATAATTGGAC
2641	AAACTACCTA	CAGAGATTTA	AAGCTCTAAG	GTAAATATAA	AATTTTTAAG	TGTATAATGT
2701	GTAAACTAG	CTGCATATGC	TTGCTGCTTG	AGAGTTTTGC	TTACTGAGTA	TGATTTATGA
2761	AAATATTATA	CACAGGAGCT	AGTGATTCTA	ATTGTTTGTG	TATTTTAGAT	TCACAGTCCC
2821	AAGGCTCATT	TCAGGCCCCCT	CAGTCCTCAC	AGTCTGTTCA	TGATCATAAT	CAGCCATACC
2881	ACATTTGTAG	AGGTTTTACT	TGCTTTAAAA	AACCTCCAC	ACCTCCCCCT	GAACCTGAAA
2941	CATAAAATGA	ATGCAATTGT	TGTTGTAAAC	TTGTTTATTG	CAGCTTATAA	TGGTTACAAA
3001	TAAAGCAATA	GCATCACAAA	TTTCACAAAT	AAAGCATTTT	TTTCACTGCA	TTCTAGTTGT
3061	GGTTTGTCCA	AACTCATCAA	TGTATCTTAT	CATGTCTGGA	TCGATCCTGC	ATTAATGAAT
3121	CGGCCAACGC	GCGGGGAGAG	GCGGTTTGCG	TATTGGCTGG	CGTAATAGCG	AAGAGGCCCG
3181	CACCGATCGC	CCTTCCCAAC	AGTTGCGCAG	CCTGAATGGC	GAATGGGACG	CGCCCTGTAG
3241	CGGCGCATT	AGCGCGGCGG	GTGTGGTGGT	TACGCGCAGC	GTGACCGCTA	CACTTGCCAG
3301	CGCCCTAGCG	CCCGCTCCTT	TCGCTTTCCT	CCCTTCCTTT	CTCGCCACGT	TCGCCGGCTT
3361	TCCCCGTCAA	GCTCTAAATC	GGGGGCTCCC	TTAGGGTTC	CGATTTAGTG	CTTTACGGCA
3421	CCTCGACCCC	AAAAAACTTG	ATTAGGGTGA	TGGTTCACGT	AGTGGGCCAT	CGCCCTGATA
3481	GACGGTTTTT	CGCCCTTTGA	CGTTGGAGTC	CACGTTCTTT	AATAGTGGAC	TCTTGTTCCT
3541	AACTGGAACA	AACTCAACC	CTATCTCGGT	CTATTCTTTT	GATTTATAAG	GGATTTTGCC
3601	GATTTGCGCC	TATTGGTTAA	AAAATGAGCT	GATTTAACAA	AAATTTAACG	CGAATTTTAA
3661	CAAAATATTA	ACGTTTACAA	TTTCAGGTGG	CACTTTTCGG	GGAAATGTGC	GCGGAACCCC
3721	TATTTGTTTA	TTTTTCTAAA	TACATTCAAA	TATGTATCCG	CTCATGCCAG	GTCTTGGACT
3781	GGTGAGAACG	GCTTGCTCGG	CAGCTTCGAT	GTGTGCTGGA	GGGAGAATAA	AGGTCTAAGA
3841	TGTGCGATAG	AGGGAAGTCG	CATTGAATTA	TGTGCTGTGT	AGGGATCGCT	GGTATCAAA
3901	ATGTGTGCCC	ACCCCTGGCA	TGAGACAATA	ACCCTGATAA	ATGCTTCAAT	AATATTGAAA
3961	AAGGAAGAGT	ATGAGTATTC	AACATTTCCG	TGTCGCCCTT	ATTCCCTTTT	TTGCGGCATT
4021	TTGCCCTTCT	GTTTTTGCTC	ACCCAGAAAC	GCTGGTGAAA	GTAAAGATG	CTGAAGATCA
4081	GTTGGGTGCA	CGAGTGGGTT	ACATCGAACT	GGATCTCAAC	AGCGGTAAGA	TCCTTGAGAG
4141	TTTTCGCCCC	GAAGAACGTT	TTCCAATGAT	GAGCACTTTT	AAAGTTCTGC	TATGTGGCGC

FIG.27C

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4201 GGTATTATCC CGTATTGACG CCGGGCAAGA GCAACTCGGT CGCCGCATAC ACTATTCTCA
4261 GAATGACTTG GTTGAGTACT CACCAGTCAC AGAAAAGCAT CTTACGGATG GCATGACAGT
4321 AAGAGAATTA TGCAGTGCTG CCATAACCAT GAGTGATAAC ACTGCGGCCA ACTTACTTCT
4381 GACAACGATC GGAGGACCGA AGGAGCTAAC CGCTTTTTTG CACAACATGG GGGATCATGT
4441 AACTCGCCTT GATCGTTGGG AACCGGAGCT GAATGAAGCC ATACCAAACG ACGAGCGTGA
4501 CACCACGATG CCTGTAGCAA TGGCAACAAC GTTGCGCAAA CTATTAAGT GCGAACTACT
4561 TACTCTAGCT TCCCGGCAAC AATTAATAGA CTGGATGGAG GCGGATAAAG TTGCAGGACC
4621 ACTTCTGCGC TCGGCCCTTC CGGCTGGCTG GTTTATTGCT GATAAATCTG GAGCCGGTGA
4681 GCGTGGGTCT CGCGGTATCA TTGCAGCACT GGGGCCAGAT GGTAAGCCCT CCCGTATCGT
4741 AGTTATCTAC ACGACGGGGA GTCAGGCAAC TATGGATGAA CGAAATAGAC AGATCGCTGA
4801 GATAGGTGCC TCACTGATTA AGCATTGGTA ACTGTCAGAC CAAGTTTACT CATATATACT
4861 TTAGATTGAT TAAAACTTC ATTTTAAATT TAAAAGGATC TAGGTGAAGA TCCTTTTTGA
4921 TAATCTCATG CCATAACTTC GTATAATGTA TGCTATACGA AGTTATGGCA TGACCAAAT
4981 CCCTTAACGT GAGTTTTCTG TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC
5041 TTCTTGAGAT CCTTTTTTTC TGCGCGTAAT CTGCTGCTTG CAAACAAAAA AACCACCGCT
5101 ACCAGCGGTG GTTTGTTTGC CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAAGTGG
5161 CTTCAAGACA GCGCAGATAC CAAATACTGT CTTCTAGTG TAGCCGTAGT TAGGCCACCA
5221 CTTCAAGAAC TCTGTAGCAC CGCCTACATA CCTCGCTCTG CTAATCCTGT TACCAGTGGC
5281 TGCTGCCAGT GGCAGATAAG CGTGTCTTAC CGGGTTGGAC TCAAGACGAT AGTTACCGGA
5341 TAAGGCGCAG CGGTCGGGCT GAACGGGGGG TTCGTGCACA CAGCCCAGCT TGGAGCGAAC
5401 GACCTACACC GAACTGAGAT ACCTACAGCG TGAGCATTGA GAAAGCGCCA CGCTTCCCGA
5461 AGGGAGAAAG GCGGACAGGT ATCCGGTAAG CGGCAGGGTC GGAACAGGAG AGCGCACGAG
5521 GGAGCTTCCA GGGGGAAACG CCTGGTATCT TTATAGTCCT GTCGGGTTTC GCCACCTCTG
5581 ACTTGAGCGT CGATTTTTGT GATGCTCGTC AGGGGGGCGG AGCCTATGGA AAAACGCCAG
5641 CAACGCGGCC TTTTACGGT TCCTGGCCTT TTGCTGGCCT TTTGCTCACA TGTTCTTTCC
5701 TCGGTTATCC CCTGATTCTG TGGATAACCG TATTACCGCC TTTGAGTGAG CTGATACCGC
5761 TCGCCGCAGC CGAACGACCG AGCGCAGCGA GTCAGTGAGC GAGGAAGCGG AAGAGCGCCC
5821 AATACGCAAA CCGCCTCTCC CCGCGCGTTG GCCGATTCAT TAATGCAGAG CTTGCAATTC
5881 GCGCGTTTTT CAATATTATT GAAGCATTTA TCAGGGTTAT TGTCTCATGA GCGGATACAT
5941 ATTTGAATGT ATTTAGAAAA ATAAACAAAT AGGGGTTCCG CGCACATTTT CCCGAAAAGT
6001 GCCACCTGAC GTCTAAGAAA CCATT
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FIG.27D

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pDEST8 Polyhedron Promoter, Baculovirus Transfer Plasmid

AccI
 1 cgt ata ctc cgg aat att aat aga tca tgg aga taa tta aaa tga taa cca
 gca tat gag gcc tta taa tta tct agt acc tct att aat ttt act att ggt

mRNA (polyhedrin)
 52 tct cgc aaa taa ata agt att tta ctg ttt tcg taa cag ttt tgt aat aaa
 aga gcg ttt att tat tca taa aat gac aaa agc att gtc aaa aca tta ttt

103 aaa acc tat aaa tat tcc gga tta ttc ata ccg tcc cac cat cgg gcg cgg
 ttt tgg ata ttt ata agg cct aat aag tat ggc agg gtg gta gcc cgc gcc

(Bam) Int attR1
 154 atc atc aca agt ttg tac aaa aaa gct gaa cga gaa acg taa aat gat ata
 tag tag tgt tca aac atg ttt ttt cga ctt gct ctt tgc att tta cta tat

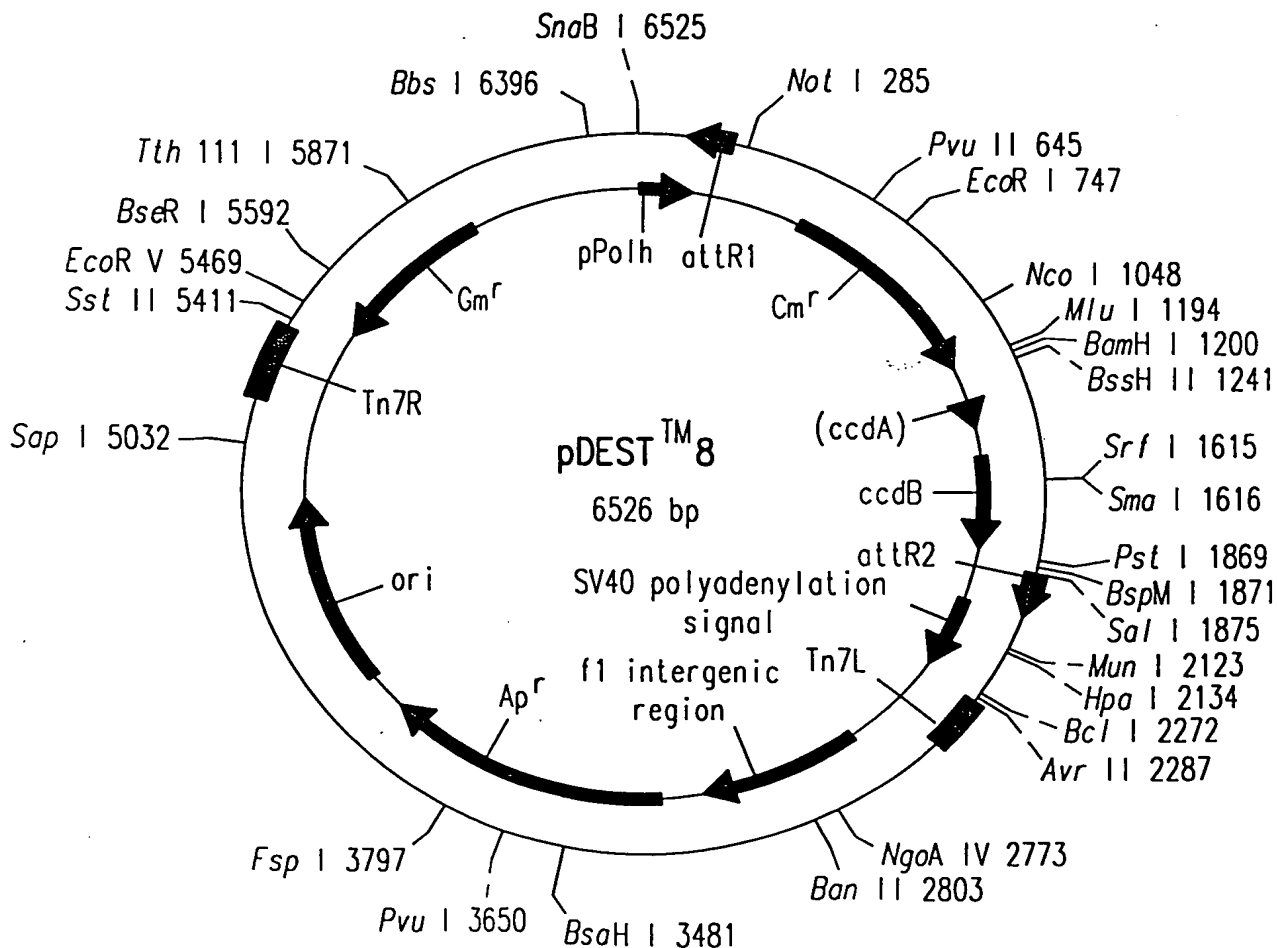


FIG.28A

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pDEST8 6526 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
23..152	Ppolh
284..160	attR1
534..1193	CmR
1313..1397	inactivated ccdA
1535..1840	ccdB
1881..2005	attR2
2766..3146	f1
3240..4090	ampR
4289..4869	ori
5564..6496	genR

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1 CGTATACTCC GGAATATTAA TAGATCATGG AGATAATTAA AATGATAACC ATCTCGCAAA
61 TAAATAAGTA TTTTACTGTT TTCGTAACAG TTTTGTAAATA AAAAAACCTA TAAATATTCC
121 GGATTATTCA TACCGTCCCA CCATCGGGCG CGGATCATCA CAAGTTTGTA CAAAAAAGCT
181 GAACGAGAAA CGTAAAATGA TATAAATATC AATATATTAA ATTAGATTTT GCATAAAAAA
241 CAGACTACAT AATACTGTAA AACACAACAT ATCCAGTCAC TATGGCGGCC GCTAAGTTGG
301 CAGCATCACC CGACGCACTT TGCGCCGAAT AAATACCTGT GACGGAAGAT CACTTCGCAG
361 AATAAATAAA TCCTGGTGTC CCTGTTGATA CCGGGAAGCC CTGGGCCAAC TTTTGGCGAA
421 AATGAGACGT TGATCGGCAC GTAAGAGGTT CCAACTTTCA CCATAATGAA ATAAGATCAC
481 TACCGGGCGT ATTTTTTGAG TTATCGAGAT TTTCAGGAGC TAAGGAAGCT AAAATGGAGA
541 AAAAAATCAC TGGATATACC ACCGTTGATA TATCCCAATG GCATCGTAAA GAACATTTTG
601 AGGCATTTCA GTCAGTTGCT CAATGTACCT ATAACCAGAC CGTTCAGCTG GATATTACGG
661 CCTTTTTTAAA GACCGTAAAG AAAAATAAGC ACAAGTTTTA TCCGGCCTTT ATTCACATTC
721 TTGCCCGCCT GATGAATGCT CATCCGGAAT TCCGTATGGC AATGAAAGAC GGTGAGCTGG
781 TGATATGGGA TAGTGTTTAC CTTGTTTACA CCGTTTTCCA TGAGCAAAC TAAACGTTTT
841 CATCGCTCTG GAGTGAATAC CACGACGATT TCCGGCAGTT TCTACACATA TATTCGCAAG
901 ATGTGGCGTG TTACGGTGAA AACCTGGCCT ATTTCCCTAA AGGGTTTATT GAGAATATGT
961 TTTTCGTCTC AGCCAATCCC TGGGTGAGTT TCACCAGTTT TGATTTAAAC GTGGCCAATA
1021 TGGACAACTT CTTGCGCCCC GTTTTCACCA TGGGCAAATA TTATACGCAA GGCGACAAGG
1081 TGCTGATGCC GCTGGCGATT CAGGTTTCATC ATGCCGTCTG TGATGGCTTC CATGTCGGCA
1141 GAATGCTTAA TGAATTACAA CAGTACTGCG ATGAGTGGCA GGGCGGGGCG TAAACGCGTG
1201 GATCCGGCTT ACTAAAAGCC AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGCGGTA
1261 TAAGAATATA TACTGATATG TATACCCGAA GTATGTCAAA AAGAGGTGTG CTATGAAGCA
1321 GCGTATTACA GTGACAGTTG ACAGCGACAG CTATCAGTTG CTCAAGGCAT ATATGATGTC
1381 AATATCTCCG GTCTGGTAAG CACAACCATG CAGAATGAAG CCCGTCGTCT GCGTGCCGAA
1441 CGCTGGAAAG CGGAAAATCA GGAAGGGATG GCTGAGGTCG CCCGTTTAT TGAAATGAAC
1501 GGCTCTTTTG CTGACGAGAA CAGGGACTGG TGAAATGCAG TTTAAGGTTT ACACCTATAA
1561 AAGAGAGAGC CGTTATCGTC TGTTTGTGGA TGTACAGAGT GATATTATTG ACACGCCCGG
1621 GCGACGGATG GTGATCCCCC TGGCCAGTGC ACGTCTGCTG TCAGATAAAG TCTCCCGTGA
1681 ACTTTACCCG GTGGTGCATA TCGGGGATGA AAGCTGGCGC ATGATGACCA CCGATATGGC

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FIG.28B

1741	CAGTGTGCCG	GTCTCCGTTA	TCGGGGAAGA	AGTGGCTGAT	CTCAGCCACC	GCGAAAATGA
1801	CATCAAAAAC	GCCATTAACC	TGATGTTCTG	GGGAATATAA	ATGTCAGGCT	CCCTTATACA
1861	CAGCCAGTCT	GCAGGTCGAC	CATAGTGA CT	GGATATGTTG	TGTTTTACAG	TATTATGTAG
1921	TCTGTTTTTT	ATGCAAAATC	TAATTTAATA	TATTGATATT	TATATCATTT	TACGTTTCTC
1981	GTTTCAGCTTT	CTTGTACAAA	GTGGTGATAG	CTTGTGAGAG	AGTACTAGAG	GATCATAATC
2041	AGCCATACCA	CATTTGTAGA	GGTTTTACTT	GCTTTAAAAA	ACCTCCCACA	CCTCCCCCTG
2101	AACCTGAAAC	ATAAAATGAA	TGCAATTGTT	GTTGTAACT	TGTTTATTGC	AGCTTATAAT
2161	GGTTACAAAT	AAAGCAATAG	CATCACAAAT	TTCACAAATA	AAGCATTTTT	TTCACTGCAT
2221	TCTAGTTGTG	GTTTGTCCAA	ACTCATCAAT	GTATCTTATC	ATGTCTGGAT	CTGATCACTG
2281	CTTGAGCCTA	GGAGATCCGA	ACCAGATAAG	TGAAATCTAG	TTCCAAACTA	TTTTGTCAAT
2341	TTTAATTTTC	GTATTAGCTT	ACGACGCTAC	ACCCAGTTCC	CATCTATTTT	GTCACTCTTC
2401	CCTAAATAAT	CCTTAAAAAC	TCCATTTCCA	CCCCTCCCAG	TTCCCAACTA	TTTTGTCCGC
2461	CCACAGCGGG	GCATTTTTCT	TCCTGTTATG	TTTTTAATCA	AACATCCTGC	CAACTCCATG
2521	TGACAAACCG	TCATCTTCGG	CTACTTTTTT	TCTGTACACAG	AATGAAAATT	TTTCTGTCAT
2581	CTCTTCGTTA	TTAATGTTTG	TAATTGACTG	AATATCAACG	CTTATTTGCA	GCCTGAATGG
2641	CGAATGGACG	CGCCCTGTAG	CGGCGCATT	AGCGCGGCGG	GTGTGGTGGT	TACGCGCAGC
2701	GTGACCGCTA	CACTTGCCAG	CGCCCTAGCG	CCCGCTCCTT	TCGCTTTCTT	CCCTTCCTTT
2761	CTCGCCACGT	TCGCCGGCTT	TCCCCGTCAA	GCTCTAAATC	GGGGGCTCCC	TTTAGGGTTC
2821	CGATTTAGTG	CTTTACGGCA	CCTCGACCCC	AAAAAACTTG	ATTAGGGTGA	TGGTTCACGT
2881	AGTGGGCCAT	CGCCCTGATA	GACGGTTTTT	CGCCCTTTGA	CGTTGGAGTC	CACGTTCTTT
2941	AATAGTGGAC	TCTTGTTCCA	AACTGGAACA	ACACTCAACC	CTATCTCGGT	CTATTCTTTT
3001	GATTTATAAG	GGATTTTGCC	GATTTGCGCC	TATTGGTTAA	AAAATGAGCT	GATTTAACAA
3061	AAATTTAACG	CGAATTTTAA	CAAAATATTA	ACGTTTACAA	TTTCAGGTGG	CATTTTTCGG
3121	GGAAATGTGC	GCGGAACCCC	TATTTGTTTA	TTTTTCTAAA	TACATTCAAA	TATGTATCCG
3181	CTCATGAGAC	AATAACCCTG	ATAAATGCTT	CAATAATATT	GAAAAAGGAA	GAGTATGAGT
3241	ATTCAACATT	TCCGTGTCGC	CCTTATTCCC	TTTTTTGCGG	CATTTTGCCT	TCCTGTTTTT
3301	GCTCACCCAG	AAACGCTGGT	GAAAGTAAAA	GATGCTGAAG	ATCAGTTGGG	TGCACGAGTG
3361	GGTTACATCG	AACTGGATCT	CAACAGCGGT	AAGATCCTTG	AGAGTTTTCG	CCCCGAAGAA
3421	CGTTTTCCAA	TGATGAGCAC	TTTTAAAGTT	CTGCTATGTG	GCGCGGTATT	ATCCCGTATT
3481	GACGCCGGGC	AAGAGCAACT	CGGTCGCCGC	ATACACTATT	CTCAGAATGA	CTTGGTTGAG
3541	TACTCACCCAG	TCACAGAAAA	GCATCTTACG	GATGGCATGA	CAGTAAGAGA	ATTATGCAGT
3601	GCTGCCATAA	CCATGAGTGA	TAACACTGCG	GCCAACTTAC	TTCTGACAAC	GATCGGAGGA
3661	CCGAAGGAGC	TAACCGCTTT	TTTGACACAAC	ATGGGGGATC	ATGTAACCTG	CCTTGATCGT
3721	TGGGAACCGG	AGCTGAATGA	AGCCATACCA	AACGACGAGC	GTGACACCAC	GATGCCTGTA
3781	GCAATGGCAA	CAACGTTGCG	CAAACTATTA	ACTGGCGAAC	TACTTACTCT	AGCTTCCCGG
3841	CAACAATTAA	TAGACTGGAT	GGAGGCGGAT	AAAGTTGCAG	GACCACTTCT	GCGCTCGGCC
3901	CTTCCGGCTG	GCTGGTTTAT	TGCTGATAAA	TCTGGAGCCG	GTGAGCGTGG	GTCTCGCGGT
3961	ATCATTGCAG	CACTGGGGCC	AGATGGTAAG	CCCTCCCGTA	TCGTAGTTAT	CTACACGACG
4021	GGGAGTCAGG	CAACTATGGA	TGAACGAAAT	AGACAGATCG	CTGAGATAGG	TGCCTCACTG
4081	ATTAAGCATT	GGTAACTGTC	AGACCAAGTT	TACTCATATA	TACTTTAGAT	TGATTTAAAA
4141	CTTCATTTTT	AATTTAAAAAG	GATCTAGGTG	AAGATCCTTT	TTGATAATCT	CATGACCAAA

FIG.28C

4201 ATCCCTTAAC GTGAGTTTTT GTTCCACTGA GCGTCAGACC CCGTAGAAAA GATCAAAGGA
 4261 TCTTCTTGAG ATCCTTTTTT TCTGCGCGTA ATCTGCTGCT TGCAAACAAA AAAACCACCG
 4321 CTACCAGCGG TGGTTTGTTT GCCGGATCAA GAGCTACCAA CTCTTTTTCC GAAGGTAAC
 4381 GGCTTCAGCA GAGCGCAGAT ACCAAATACT GTCCTTCTAG TGTAGCCGTA GTTAGGCCAC
 4441 CACTTCAAGA ACTCTGTAGC ACCGCCTACA TACCTCGCTC TGCTAATCCT GTTACCAGTG
 4501 GCTGCTGCCA GTGGCGATAA GTCGTGTCTT ACCGGGTTGG ACTCAAGACG ATAGTTACCG
 4561 GATAAGGCGC AGCGGTCGGG CTGAACGGGG GGTTCGTGCA CACAGCCCAG CTTGGAGCGA
 4621 ACGACCTACA CCGAACTGAG ATACCTACAG CGTGAGCATT GAGAAAGCGC CACGCTTCCC
 4681 GAAGGGAGAA AGGCGGACAG GTATCCGGTA AGCGGCAGGG TCGGAACAGG AGAGCGCACG
 4741 AGGGAGCTTC CAGGGGGAAA CGCCTGGTAT CTTTATAGTC CTGTCGGGT TCGCCACCTC
 4801 TGACTTGAGC GTCGATTTTT GTGATGCTCG TCAGGGGGGC GGAGCCTATG GAAAAACGCC
 4861 AGCAACGCGG CCTTTTTACG GTTCCTGGCC TTTTGCTGGC CTTTTGCTCA CATGTTCTTT
 4921 CCTGCGTTAT CCCCTGATTC TGTGGATAAC CGTATTACCG CCTTTGAGTG AGCTGATACC
 4981 GCTCGCCGCA GCCGAACGAC CGAGCGCAGC GAGTCAGTGA GCGAGGAAGC GGAAGAGCGC
 5041 CTGATGCGGT ATTTTCTCCT TACGCATCTG TGCGGTATTT CACACCGCAG ACCAGCCGCG
 5101 TAACCTGGCA AAATCGGTTA CGGTTGAGTA ATAAATGGAT GCCCTGCGTA AGCGGGTGTG
 5161 GGCGGACAAT AAAGTCTTAA ACTGAACAAA ATAGATCTAA ACTATGACAA TAAAGTCTTA
 5221 AACTAGACAG AATAGTTGTA AACTGAAATC AGTCCAGTTA TGCTGTGAAA AAGCATACTG
 5281 GACTTTTGTT ATGGCTAAAG CAACTCTTC ATTTTCTGAA GTGCAAATTG CCCGTCGTAT
 5341 TAAAGAGGGG CGTGGCCAAG GGCATGGTAA AGACTATATT CGCGGCGTTG TGACAATTTA
 5401 CCGAACAACT CCGCGGCCGG GAAGCCGATC TCGGCTTGAA CGAATTGTGA GGTGGCGGTA
 5461 CTTGGGTCGA TATCAAAGTG CATCACTTCT TCCCGTATGC CCAACTTTGT ATAGAGAGCC
 5521 ACTGCGGGAT CGTCACCGTA ATCTGCTTGC ACGTAGATCA CATAAGCACC AAGCGCGTTG
 5581 GCCTCATGCT TGAGGAGATT GATGAGCGCG GTGGCAATGC CCTGCCTCCG GTGCTCGCCG
 5641 GAGACTGCCA GATCATAGAT ATAGATCTCA CTACGCGGCT GCTCAAACCT GGGCAGAACG
 5701 TAAGCCGCGA GAGCGCCAAC AACCGCTTCT TGGTCGAAGG CAGCAAGCGC GATGAATGTC
 5761 TTAACACGGA GCAAGTTCCC GAGGTAATCG GAGTCCGGCT GATGTTGGGA GTAGGTGGCT
 5821 ACGTCTCCGA ACTCACGACC GAAAAGATCA AGAGCAGCCC GCATGGATTT GACTTGGTCA
 5881 GGGCCGAGCC TACATGTGCG AATGATGCCC ATACTTGAGC CACCTAACTT TGTTTTAGGG
 5941 CGACTGCCCT GCTGCGTAAC ATCGTTGCTG CTGCGTAACA TCGTTGCTGC TCCATAACAT
 6001 CAAACATCGA CCCACGGCGT AACGCGCTTG CTGCTTGGAT GCCCGAGGCA TAGACTGTAC
 6061 AAAAAACAG TCATAACAAG CCATGAAAAC CGCCACTGCG CCGTTACCAC CGCTGCGTTC
 6121 GGTCAAGGTT CTGGACCAGT TGCGTGAGCG CATAACGCTAC TTGCATTACA GTTTACGAAC
 6181 CGAACAGGCT TATGTCAACT GGGTTCGTGC CTTTCATCCGT TTCCACGGTG TCGTCAACC
 6241 GGCAACCTTG GGCAGCAGCG AAGTCGAGGC ATTTCTGTCC TGGCTGGCGA ACGAGCGCAA
 6301 GGTTTCGGTC TCCACGCATC GTCAGGCATT GGCGGCCCTG CTGTTCTTCT ACGGCAAGGT
 6361 GCTGTGCACG GATCTGCCCT GGCTTCAGGA GATCGGAAGA CCTCGGCCGT CGCGGCGCTT
 6421 GCCGGTGGTG CTGACCCCGG ATGAAGTGGT TCGCATCCTC GGTTTTCTGG AAGGCGAGCA
 6481 TCGTTTGTTT GCCCAGGACT CTAGCTATAG TTCTAGTGGT TGGCTA

FIG.28D

SEMLIKI FOREST VIRUS VECTOR

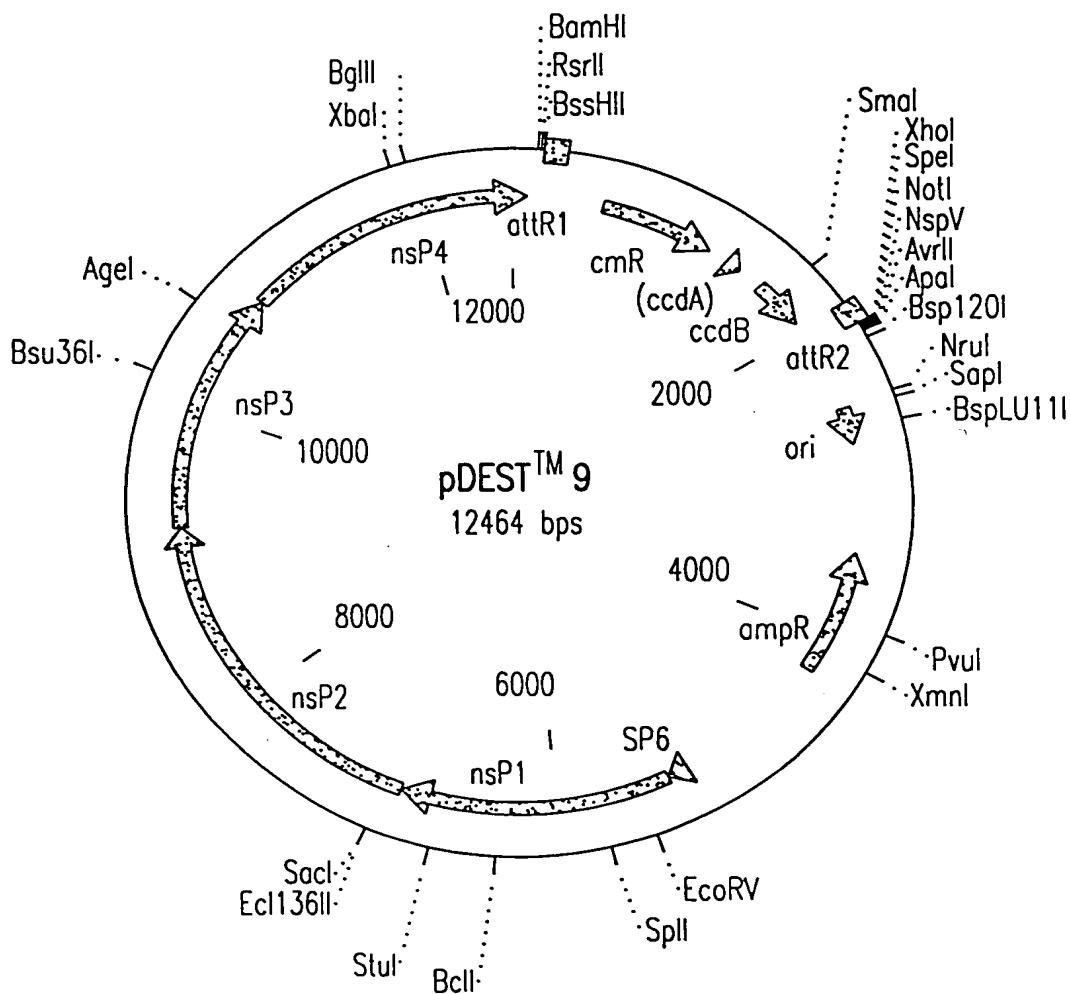
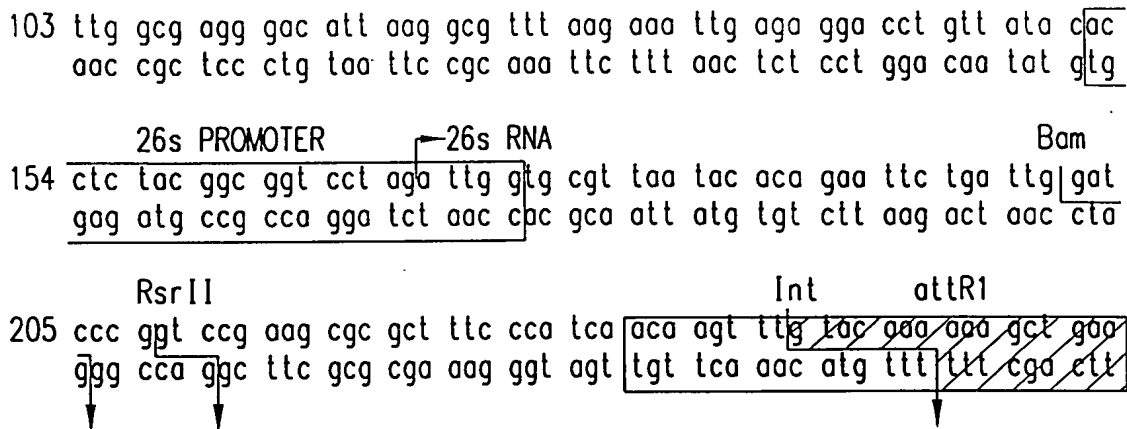


FIG.29A

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pDEST9 12464 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
355..232	attR1
605..1264	CmR
1384..1468	inactivated ccdA
1606..1911	ccdB
1952..2078	attR2
2532..2782	ori
3482..4282	ampR
5232..5365	SP6 promoter
5365..6965	nsP1:non-structural protein 1
6965..9265	nsP2:non-structural protein 2
9265..10865	nsP3:non-structural protein 3
10865..161	nsP4:non-structural protein 4

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1 AGCAAGTGGT TCCGGACAGG CTTGGGGGCC GAACTGGAGG TGGCACTAAC ATCTAGGTAT
61 GAGGTAGAGG GCTGCAAAAG TATCCTCATA GCCATGGCCA CCTTGGCGAG GGACATTAAG
121 GCGTTTAAAG AATTGAGAGG ACCTGTTATA CACCTCTACG GCGGTCCTAG ATTGGTGCGT
181 TAATACACAG AATTCTGATT GGATCCCGGT CCGAAGCGCG CTTTCCCATC ACAAGTTTGT
241 ACAAAAAAGC TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA AATTAGATTT
301 TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC
361 CGCTAAGTTG GCAGCATCAC CCGACGCACT TTGCGCCGAA TAAATACCTG TGACGGAAGA
421 TCACTTCGCA GAATAAATAA ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC CCTGGGCCAA
481 CTTTTGGCGA AAATGAGACG TTGATCGGCA CGTAAGAGGT TCCAAC TTTC ACCATAATGA
541 AATAAGATCA CTACCGGGCG TATTTTTTGA GTTATCGAGA TTTTCAGGAG CTAAGGAAGC
601 TAAATGGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA
661 AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT
721 GGATATTACG GCCTTTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT ATCCGGCCTT
781 TATTCACATT CTTGCCC GCC TGGATGAATGC TCATCCGGA TTCCGTATGG CAATGAAAGA
841 CGGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC ATGAGCAAAC
901 TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT
961 ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT
1021 TGAGAAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAGTT TTGATTTAAA
1081 CGTGGCCAAT ATGGACA ACT TCTTCGCCCC CGTTTTTACC ATGGGCAAAT ATTATACGCA
1141 AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTTCA CATGCCGTCT GTGATGGCTT
1201 CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC
1261 GTAAAGATCT GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT TGCGCGCTGA
1321 TTTTTGCGGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT
1381 GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA
1441 TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA GCCCGTCGTC
1501 TGCGTGCCGA ACGCTGGAAA GCGGAAAATC AGGAAGGGAT GGCTGAGGTC GCCCGGTTTA
1561 TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA GTTTAAGGTT

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FIG.29B

1621	TACACCTATA	AAAGAGAGAG	CCGTTATCGT	CTGTTTGTGG	ATGTACAGAG	TGATATTATT
1681	GACACGCCCC	GGCGACGGAT	GGTGATCCCC	CTGGCCAGTG	CACGTCTGCT	GTCAGATAAA
1741	GTCTCCCGTG	AACTTTACCC	GGTGGTGCAT	ATCGGGGATG	AAAGCTGGCG	CATGATGACC
1801	ACCGATATGG	CCAGTGTGCC	GGTCTCCGTT	ATCGGGGAAG	AAGTGGCTGA	TCTCAGCCAC
1861	CGCGAAAATG	ACATCAAAAA	CGCCATTAAAC	CTGATGTTCT	GGGGAATATA	AATGTCAGGC
1921	TCCCTTATAC	ACAGCCAGTC	TGCAGGTCGA	CCATAGTGAC	TGGATATGTT	GTGTTTTACA
1981	GTATTATGTA	GTCTGTTTTT	TATGCAAAAG	TGCTAATTTA	ATATATTGAT	ATTTATATCA
2041	TTTTACGTTT	CTCGTTCAGC	TTTCTTGTAAC	AAAGTGGTGA	TGGGAAGTCTG	AGTTCACTAG
2101	TCGATCCCGC	GGCCGCTTTC	GAACCTAGGC	AAGCATGCGG	GCCCAGTGGG	TAATTAATTG
2161	AATTACATCC	CTACGCAAAAC	GTTTTACGGC	CGCCGGTGGC	GCCCGCGCCC	GGCGGCCCGT
2221	CCTTGGCCGT	TGCAGGCCAC	TCCGGTGGCT	CCCGTCGTCC	CCGACTTCCA	GGCCCAGCAG
2281	ATGCAGCAAC	TCATCAGCGC	CGTAAATGCG	CTGACAATGA	GACAGAACGC	AATTGCTCCT
2341	GCTAGGAGCT	TAATTCGACG	AATAATTGGA	TTTTTATTTT	ATTTTGCAAT	TGGTTTTTAA
2401	TATTTCCAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA	AAAAAAAAAA
2461	AAAAAAAAAA	AAAAAACTA	GAAATCGCGA	TTTCTAGTCT	GCATTAATGA	ATCGGCCAAC
2521	GCGCGGGGAG	AGGCGGTTTG	CGTATTGGGC	GCTCTTCCGC	TTCTCGCTC	ACTGACTCGC
2581	TGCGCTCGGT	CGTTCGGCTG	CGGCGAGCGG	TATCAGCTCA	CTCAAAGGCG	GTAATACGGT
2641	TATCCACAGA	ATCAGGGGAT	AACGCAGGAA	AGAACATGTG	AGCAAAAGGC	CAGCAAAAGG
2701	CCAGGAACCG	TAAAAAGGCC	GCGTTGCTGG	CGTTTTTCCA	TAGGCTCCGC	CCCCCTGACG
2761	AGCATCACAA	AAATCGACGC	TCAAGTCAGA	GGTGGCGAAA	CCCGACAGGA	CTATAAAGAT
2821	ACCAGGCGTT	TCCCCCTGGA	AGCTCCCTCG	TGCGCTCTCC	TGTTCCGACC	CTGCCGCTTA
2881	CCGGATACCT	GTCCGCCTTT	CTCCCTTCGG	GAAGCGTGGC	GCTTTCTCAA	TGCTCGCGCT
2941	GTAGGTATCT	CAGTTCGGTG	TAGGTCGTTT	GCTCCAAGCT	GGGCTGTGTG	CACGAACCCC
3001	CCGTTTCAGCC	CGACCGCTGC	GCCTTATCCG	GTAACATATCG	TCTTGAGTCC	AACCCGGTAA
3061	GACACGACTT	ATCGCCACTG	GCAGCAGCCA	CTGGTAACAG	GATTAGCAGA	GCGAGGTATG
3121	TAGGCGGTGC	TACAGAGTTC	TTGAAGTGGT	GGCCTAACTA	CGGCTACACT	AGAAGGACAG
3181	TATTTGGTAT	CTGCGCTCTG	CTGAAGCCAG	TTACCTTCGG	AAAAAGAGTT	GGTAGCTCTT
3241	GATCCGGCAA	ACAAACCACC	GCTGGTAGCG	GTGGTTTTTT	TGTTTGCAAG	CAGCAGATTA
3301	CGCGCAGAAA	AAAAGGATCT	CAAGAAGATC	CTTTGATCTT	TTCTACGGGG	TCTGACGCTC
3361	AGTGGAACGA	AAACTCACGT	TAAGGGATTT	TGGTCATGAG	ATTATCAAAA	AGGATCTTCA
3421	CCTAGATCCT	TTTAAATTAA	AAATGAAGTT	TTAAATCAAT	CTAAAGTATA	TATGAGTAAA
3481	CTTGGTCTGA	CAGTTACCAA	TGCTTAATCA	GTGAGGCACC	TATCTCAGCG	ATCTGTCTAT
3541	TTCGTTCATC	CATAGTTGCC	TGACTCCCCG	TCGTGTAGAT	AACTACGATA	CGGGAGGGCT
3601	TACCATCTGG	CCCCAGTGCT	GCAATGATAC	CGCGAGACCC	ACGCTCACCG	GCTCCAGATT
3661	TATCAGCAAT	AAACCAGCCA	GCCGGAAGGG	CCGAGCGCAG	AAGTGGTCCT	GCAACTTTAT
3721	CCGCCTCCAT	CCAGTCTATT	AATTGTTGCC	GGGAAGCTAG	AGTAAGTAGT	TCGCCAGTTA
3781	ATAGTTTGCG	CAACGTTGTT	GCCATTGCTA	CAGGCATCGT	GGTGTCACGC	TCGTGTTTTG
3841	GTATGGCTTC	ATTCAGCTCC	GGTTCCCAAC	GATCAAGGCG	AGTTACATGA	TCCCCCATGT
3901	TGTGCAAAAA	AGCGGTTAGC	TCCTTCGGTC	CTCCGATCGT	TGTCAGAAGT	AAGTTGGCCG
3961	CAGTGTTATC	ACTCATGGTT	ATGGCAGCAC	TGCATAATTC	TCTTACTGTC	ATGCCATCCG
4021	TAAGATGCTT	TTCTGTGACT	GGTGAGTACT	CAACCAAGTC	ATTCTGAGAA	TAGTGTATGC

FIG.29C

4081 GGCGACCGAG TTGCTCTTGC CCGGCGTCAA TACGGGATAA TACCGCGCCA CATAGCAGAA
 4141 CTTTAAAAGT GCTCATCATT GGAAAACGTT CTTCGGGGCG AAAACTCTCA AGGATCTTAC
 4201 CGCTGTTGAG ATCCAGTTCG ATGTAACCCA CTCGTGCACC CAACTGATCT TCAGCATCTT
 4261 TTACTTTTAC CAGCGTTTCT GGGTGAGCAA AAACAGGAAG GCAAAATGCC GCAAAAAAGG
 4321 GAATAAGGGC GACACGGAAT TGTTGAATAC TCATACTCTT CCTTTTTTCAA TATTATTGAA
 4381 GCATTTATCA GGGTTATTGT CTCATGAGCG GATACATATT TGAATGTATT TAGAAAAATA
 4441 AACAAATAGG GGTTCGCGCG ACATTTCCCC GAAAAGTGCC ACCTGACGTC TAAGAAACCA
 4501 TTATTATCAT GACATTAACC TATAAAAATA GCGGTATCAC GAGGCCCTTT CGTCTCGCGC
 4561 GTTTCGGTGA TGACGGTGAA AACCTCTGAC ACATGCAGCT CCCGGAGACG GTCACAGCTT
 4621 CTGTCTAAGC GGATGCCGGG AGCAGACAAG CCCGTCAGGG CGCGTCAGCG GGTGTTGGCG
 4681 GGTGTCGGGG CTGGCTTAAC TATGCGGCAT CAGAGCAGAT TGTACTGAGA GTGCACCATA
 4741 TCGACGCTCT CCCTTATGCG ACTCCTGCAT TAGGAAGCAG CCCAGTACTA GGTTGAGGCC
 4801 GTTGAGCACC GCCGCCGCAA GGAATGGTGC ATGCAAGGAG ATGGCGCCCA ACAGTCCCCC
 4861 GGCCACGGGG CCTGCCACCA TACCCACGCC GAAACAAGCG CTCATGAGCC CGAAGTGGCG
 4921 AGCCCGATCT TCCCCATCGG TGATGTCGGC GATATAGGCG CCAGCAACCG CACCTGTGGC
 4981 GCCGGTGATG CCGGCCACGA TCGCTCCGGC GTAGAGGATC TGGCTAGCGA TGACCCTGCT
 5041 GATTGGTTTC CTGACCATT TCCGGGGTGC GAACGGCGTT ACCAGAACT CAGAAGGTTT
 5101 GTCCAACCAA ACCGACTCTG ACGGCAGTTT ACGAGAGAGA TGATAGGGTC TGCTTCAGTA
 5161 AGCCAGATGC TACACAATTA GGCTTGTACA TATTGTCGTT AGAACGCGGC TACAATTAAT
 5221 ACATAACCTT ATGTATCATA CACATACGAT TTAGGTGACA CTATAGATGG CGGATGTGTG
 5281 ACATACACGA CGCCAAAAGA TTTTGTTCCT GCTCCTGCCA CCTCCGCTAC GCGAGAGATT
 5341 AACCACCCAC GATGGCCGCC AAAGTGCATG TTGATATTGA GGCTGACAGC CCATTCATCA
 5401 AGTCTTTGCA GAAGGCATTT CCGTCGTTTC AGGTGGAGTC ATTGCAGGTC ACACCAAATG
 5461 ACCATGCAAA TGCCAGAGCA TTTTCGCACC TGGCTACCAA ATTGATCGAG CAGGAGACTG
 5521 ACAAAGACAC ACTCATCTTG GATATCGGCA GTGCGCCTTC CAGGAGAATG ATGTCTACGC
 5581 ACAAATACCA CTGCGTATGC CCTATGCGCA GCGCAGAAGA CCCCAGAAAG CTCGATAGCT
 5641 ACGCAAAGAA ACTGGCAGCG GCCTCCGGGA AGGTGCTGGA TAGAGAGATC GCAGGAAAAA
 5701 TCACCGACCT GCAGACCGTC ATGGCTACGC CAGACGCTGA ATCTCCTACC TTTTGCCTGC
 5761 ATACAGACGT CACGTGTCGT ACGGCAGCCG AAGTGGCCGT ATACCAGGAC GTGTATGCTG
 5821 TACATGCACC AACATCGCTG TACCATCAGG CGATGAAAGG TGTCAGAACG GCGTATTGGA
 5881 TTGGGTTTGA CACCACCCCG TTTATGTTTG ACGCGCTAGC AGGCGCGTAT CCAACCTACG
 5941 CCACAACTG GGCCGACGAG CAGGTGTTAC AGGCCAGGAA CATAGGACTG TGTGCAGCAT
 6001 CCTTGACTGA GGAAGACTC GGCAAAGTGT CCATTCTCCG CAAGAAGCAA TTGAAACCTT
 6061 GCGACACAGT CATGTTCTCG GTAGGATCTA CATTGTACAC TGAGAGCAGA AAGCTACTGA
 6121 GGAGCTGGCA CTTACCCTCC GTATTCCACC TGAAAGGTAA ACAATCCTTT ACCTGTAGGT
 6181 GCGATACCAT CGTATCATGT GAAGGGTACG TAGTTAAGAA AATCACTATG TGCCCCGGCC
 6241 TGTACGGTAA AACGGTAGGG TACGCCGTGA CGTATCACGC GGAGGGATTG CTAGTGTGCA
 6301 AGACCACAGA CACTGTCAAA GGAGAAAGAG TCTCATTCCC TGTATGCACC TACGTCCCCT
 6361 CAACCATCTG TGATCAAATG ACTGGCATA TAGCGACCGA CGTCACACCG GAGGACGCAC
 6421 AGAAGTTGTT AGTGGGATTG AATCAGAGGA TAGTTGTGAA CGGAAGAAC CAGCGAAACA
 6481 CTAACACGAT GAAGAACTAT CTGCTTCCGA TTGTGGCCGT CGCATTTAGC AAGTGGGCGA

FIG.29D

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6541	GGGAATACAA	GGCAGACCTT	GATGATGAAA	AACCTCTGGG	TGTCCGAGAG	AGGTCACCTTA
6601	CTTGCTGCTG	CTTGTTGGCA	TTTAAAACGA	GGAAGATGCA	CACCATGTAC	AAGAAACCAG
6661	ACACCCAGAC	AATAGTGAAG	GTGCCTTCAG	AGTTTAACTC	GTTCGTCATC	CCGAGCCTAT
6721	GGTCTACAGG	CCTCGCAATC	CCAGTCAGAT	CACGCATTAA	GATGCTTTTG	GCCAAGAAGA
6781	CCAAGCGAGA	GTTAATACCT	GTTCTCGACG	CGTCGTCAGC	CAGGGATGCT	GAACAAGAGG
6841	AGAAGGAGAG	GTTGGAGGCC	GAGCTGACTA	GAGAAGCCTT	ACCACCCCTC	GTCCCCATCG
6901	CGCCGGCGGA	GACGGGAGTC	GTCGACGTCG	ACGTTGAAGA	ACTAGAGTAT	CACGCAGGTG
6961	CAGGGGTCTG	GGAAACACCT	CGCAGCGCGT	TGAAAGTCAC	CGCACAGCCG	AACGACGTAC
7021	TACTAGGAAA	TTACGTAGTT	CTGTCCCCGC	AGACCGTGCT	CAAGAGCTCC	AAGTTGGCCC
7081	CCGTGCACCC	TCTAGCAGAG	CAGGTGAAAA	TAATAACACA	TAACGGGAGG	GCCGGCGGTT
7141	ACCAGGTCGA	CGGATATGAC	GGCAGGGTCC	TACTACCATG	TGGATCGGCC	ATTCGGGTCC
7201	CTGAGTTTCA	GGCTTTGAGC	GAGAGCGCCA	CTATGGTGTA	CAACGAAAGG	GAGTTCGTCA
7261	ACAGGAAACT	ATACCATATT	GCCGTTACAG	GACCTCTGCT	GAACACCGAC	GAGGAGAACT
7321	ACGAGAAAGT	CAGAGCTGAA	AGAACTGACG	CCGAGTACGT	GTTGACGTA	GATAAAAAAT
7381	GCTGCGTCAA	GAGAGAGGAA	GCGTCGGGTT	TGGTGTTGGT	GGGAGAGCTA	ACCAACCCCC
7441	CGTTCCATGA	ATTGCGCTAC	GAAGGGCTGA	AGATCAGGCC	GTCGGCACCA	TATAAGACTA
7501	CAGTAGTAGG	AGTCTTTGGG	GTTCCGGGAT	CAGGCAAGTC	TGCTATTATT	AAGAGCCTCG
7561	TGACCAAACA	CGATCTGGTC	ACCAGCGGCA	AGAAGGAGAA	CTGCCAGGAA	ATAGTTAACG
7621	ACGTGAAGAA	GCACCGCGGG	AAGGGGACAA	GTAGGGAAAA	CAGTGACTION	ATCCTGCTAA
7681	ACGGGTGTCT	TCGTGCCGTG	GACATCCTAT	ATGTGGACGA	GGCTTTCGCT	TGCCATTCCG
7741	GTACTCTGCT	GGCCCTAATT	GCTCTTGTTA	AACCTCGGAG	CAAAGTGGTG	TTATGCGGAG
7801	ACCCCAAGCA	ATGCGGATTC	TTCAATATGA	TGCAGCTTAA	GGTGAACCTC	AACCACAACA
7861	TCTGCACTGA	AGTATGTCAT	AAAAGTATAT	CCAGACGTTG	CACGCGTCCA	GTCACGGCCA
7921	TCGTGTCTAC	GTTGCACTAC	GGAGGCAAGA	TGCGCACGAC	CAACCCGTGC	AACAAACCCA
7981	TAATCATAGA	CACCACAGGA	CAGACCAAGC	CCAAGCCAGG	AGACATCGTG	TTAACATGCT
8041	TCCGAGGCTG	GGCAAAGCAG	CTGCAGTTGG	ACTACCGTGG	ACACGAAGTC	ATGACAGCAG
8101	CAGCATCTCA	GGGCCTCACC	CGCAAAGGGG	TATACGCCGT	AAGGCAGAAG	GTGAATGAAA
8161	ATCCCTTGTA	TGCCCTGCG	TCGGAGCACG	TGAATGTACT	GCTGACGCGC	ACTGAGGATA
8221	GGCTGGTGTG	GAAAACGCTG	GCCGGCGATC	CCTGGATTAA	GGTCCTATCA	AACATTCCAC
8281	AGGGTAACTT	TACGGCCACA	TTGGAAGAAT	GGCAAGAAGA	ACACGACAAA	ATAATGAAGG
8341	TGATTGAAGG	ACCGGCTGCG	CCTGTGGACG	CGTTCCAGAA	CAAAGCGAAC	GTGTGTTGGG
8401	CGAAAAGCCT	GGTGCCTGTC	CTGGACACTG	CCGGAATCAG	ATTGACAGCA	GAGGAGTGGA
8461	GCACCATAAT	TACAGCATTT	AAGGAGGACA	GAGCTTACTC	TCCAGTGGTG	GCCTTGAATG
8521	AAATTTGCAC	CAAGTACTAT	GGAGTTGACC	TGGACAGTGG	CCTGTTTTCT	GCCCCGAAGG
8581	TGTCCCTGTA	TTACGAGAAC	AACCACTGGG	ATAACAGACC	TGGTGGAAGG	ATGTATGGAT
8641	TCAATGCCGC	AACAGCTGCC	AGGCTGGAAG	CTAGACATAC	CTTCCTGAAG	GGGCAGTGGC
8701	ATACGGGCAA	GCAGGCAGTT	ATCGCAGAAA	GAAAAATCCA	ACCGCTTTCT	GTGCTGGACA
8761	ATGTAATTCC	TATCAACCGC	AGGCTGCCGC	ACGCCCTGGT	GGCTGAGTAC	AAGACGGTTA
8821	AAGGCAGTAG	GGTTGAGTGG	CTGGTCAATA	AAGTAAGAGG	GTACCACGTC	CTGCTGGTGA
8881	GTGAGTACAA	CCTGGCTTTG	CCTCGACGCA	GGGTCACCTG	GTTGTCACCG	CTGAATGTCA
8941	CAGGCGCCGA	TAGGTGCTAC	GACCTAAGTT	TAGGACTGCC	GGCTGACGCC	GGCAGGTTCC

FIG.29E

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9001 ACTTGGTCTT TGTGAACATT CACACGGAAT TCAGAATCCA CCACTACCAG CAGTGTGTCTG
9061 ACCACGCCAT GAAGCTGCAG ATGCTTGGGG GAGATGCGCT ACGACTGCTA AAACCCGGCG
9121 GCATCTTGAT GAGAGCTTAC GGATACGCCG ATAAAATCAG CGAAGCCGTT GTTTCCTCCT
9181 TAAGCAGAAA GTTCTCGTCT GCAAGAGTGT TGCGCCCGGA TTGTGTCACC AGCAATACAG
9241 AAGTGTTCTT GCTGTTCTCC AACTTTGACA ACGGAAAGAG ACCCTCTACG CTACACCAGA
9301 TGAATACCAA GCTGAGTGCC GTGTATGCCG GAGAAGCCAT GCACACGGCC GGGTGTGCAC
9361 CATCCTACAG AGTTAAGAGA GCAGACATAG CCACGTGCAC AGAAGCGGCT GTGGTTAACG
9421 CAGCTAACGC CCGTGGAAC TTAGGGGATG GCGTATGCAG GGCCGTGGCG AAGAAATGGC
9481 CGTCAGCCTT TAAGGGAGCA GCAACACCAG TGGGCACAAT TAAAACAGTC ATGTGCGGCT
9541 CGTACCCCGT CATCCACGCT GTAGCGCCTA ATTTCTCTGC CACGACTGAA GCGGAAGGGG
9601 ACCGCGAATT GGCCGCTGTC TACCGGGCAG TGGCCGCCGA AGTAAACAGA CTGTCACTGA
9661 GCAGCGTAGC CATCCCGCTG CTGTCCACAG GAGTGTTTCA CGGCGGAAGA GATAGGCTGC
9721 AGCAATCCCT CAACCATCTA TTCACAGCAA TGGACGCCAC GGACGCTGAC GTGACCATCT
9781 ACTGCAGAGA CAAAAGTTGG GAGAAGAAAA TCCAGGAAGC CATTGACATG AGGACGGCTG
9841 TGGAGTTGCT CAATGATGAC GTGGAGCTGA CCACAGACTT GGTGAGAGTG CACCCGGACA
9901 GCAGCCTGGT GGGTCGTAAG GGCTACAGTA CCACTGACGG GTCGCTGTAC TCGTACTTTG
9961 AAGGTACGAA ATTCAACCAG GCTGCTATTG ATATGGCAGA GATACTGACG TTGTGGCCCA
10021 GACTGCAAGA GGCAAACGAA CAGATATGCC TATACGCGCT GGGCGAAACA ATGGACAACA
10081 TCAGATCCAA ATGTCCGGTG AACGATTCCG ATTCATCAAC ACCTCCCAGG ACAGTGCCCT
10141 GCCTGTGCCG CTACGCAATG ACAGCAGAAC GGATCGCCCG CCTTAGGTCA CACCAAGTTA
10201 AAAGCATGGT GGTTTGCTCA TCTTTTCCCC TCCCGAAATA CCATGTAGAT GGGGTGCAGA
10261 AGGTAAAGTG CGAGAAGGTT CTCCTGTTCTG ACCCGACGGT ACCTTCAGTG GTTAGTCCGC
10321 GGAAGTATGC CGCATCTACG ACGGACCACT CAGATCGGTC GTTACGAGGG TTTGACTTGG
10381 ACTGGACCAC CGACTCGTCT TCCACTGCCA GCGATACCAT GTCGCTACCC AGTTTGCACT
10441 CGTGTGACAT CGACTCGATC TACGAGCCAA TGGCTCCCAT AGTAGTGACG GCTGACGTAC
10501 ACCCTGAACC CGCAGGCATC GCGGACCTGG CGGCAGATGT GCACCCTGAA CCCGCAGACC
10561 ATGTGGACCT GGAGAACCCG ATTCCTCCAC CGCGCCCGAA GAGAGCTGCA TACCTTGCTT
10621 CCCGCGCGGC GGAGCGACCG GTGCCGGCGC CGAGAAAGCC GACGCCTGCC CCAAGGACTG
10681 CGTTTAGGAA CAAGCTGCCT TTGACGTTCTG GCGACTTTGA CGAGCACGAG GTCGATGCGT
10741 TGGCCTCCGG GATTACTTTC GGAGACTTCG ACGACGTCCT GCGACTAGGC CGCGCGGGTG
10801 CATATATTTT CTCCTCGGAC ACTGGCAGCG GACATTTACA AAAAAATCC GTTAGGCAGC
10861 ACAATCTCCA GTGCGCACAA CTGGATGCGG TCCAGGAGGA GAAAATGTAC CCGCCAAAAT
10921 TGGATACTGA GAGGGAGAAG CTGTTGCTGC TGAAAATGCA GATGCACCCA TCGGAGGCTA
10981 ATAAGAGTCG ATACCAGTCT CGCAAAGTGG AGAACATGAA AGCCACGGTG GTGGACAGGC
11041 TCACATCGGG GGCCAGATTG TACACGGGAG CGGACGTAGG CCGCATACCA ACATACGCGG
11101 TTCGGTACCC CCGCCCCGTG TACTCCCCTA CCGTGATCGA AAGATTCTCA AGCCCCGATG
11161 TAGCAATCGC AGCGTGCAAC GAATACCTAT CCAGAAATTA CCCAACAGTG GCGTCGTACC
11221 AGATAACAGA TGAATACGAC GCATACTTGG ACATGGTTGA CGGGTCGGAT AGTTGCTTGG
11281 ACAGAGCGAC ATTCTGCCCC GCGAAGCTCC GGTGCTACCC GAAACATCAT GCGTACCACC
11341 AGCCGACTGT ACGCAGTGCC GTCCCGTCAC CCTTTCAGAA CACACTACAG AACGTGCTAG
11401 CGGCTGCCAC CAAGAGAAAC TGCAACGTCA CGCAAATGCG AGAACTACCC ACCATGGACT

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FIG.29F

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11461 CGGCAGTGTT CAACGTGGAG TGCTTCAAGC GCTATGCCTG CTCCGGAGAA TATTGGGAAG
11521 AATATGCTAA ACAACCTATC CGGATAACCA CTGAGAACAT CACTACCTAT GTGACCAAAT
11581 TGAAAGGCCG GAAAGCTGCT GCCTTGTTTC CTAAGACCCA CAACTTGGTT CCGCTGCAGG
11641 AGGTTCCCAT GGACAGATTC ACGGTCGACA TGAAACGAGA TGTCAAAGTC ACTCCAGGGA
11701 CGAAACACAC AGAGGAAAGA CCCAAAGTCC AGGTAATTCA AGCAGCGGAG CCATTGGCGA
11761 CCGCTTACCT GTGCGGCATC CACAGGGAAT TAGTAAGGAG ACTAAATGCT GTGTTACGCC
11821 CTAACGTGCA CACATTGTTT GATATGTCGG CCGAAGACTT TGACGCGATC ATCGCCTCTC
11881 ACTTCCACCC AGGAGACCCG GTTCTAGAGA CGGACATTGC ATCATTTCGAC AAAAGCCAGG
11941 ACGACTCCTT GGCTCTTACA GGTTTAATGA TCCTCGAAGA TCTAGGGGTG GATCAGTACC
12001 TGCTGGACTT GATCGAGGCA GCCTTTGGGG AAATATCCAG CTGTCACCTA CCAACTGGCA
12061 CGCGCTTCAA GTTCGGAGCT ATGATGAAAT CGGGCATGTT TCTGACTTTG TTTATTAACA
12121 CTGTTTTTGA CATCACCATA GCAAGCAGGG TACTGGAGCA GAGACTCACT GACTCCGCCT
12181 GTGCGGCCTT CATCGGCGAC GACAACATCG TTCACGGAGT GATCTCCGAC AAGCTGATGG
12241 CGGAGAGGTG CGCGTCGTGG GTCAACATGG AGGTGAAGAT CATTGACGCT GTCATGGGCG
12301 AAAAACCCCC ATATTTTTGT GGGGGATTCA TAGTTTTTGA CAGCGTCACA CAGACCGCCT
12361 GCCGTGTTTC AGACCCACTT AAGCGCCTGT TCAAGTTGGG TAAGCCGCTA ACAGCTGAAG
12421 ACAAGCAGGA CGAAGACAGG CGACGAGCAC TGAGTGACGA GGTT

FIG.29G

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pDEST10 Polyhedron Promoter with N-His6, Baculovirus Transfer Plasmid

mRNA from polyhedrin promoter
 154 aaa taa gta ttt tac tgt ttt cgt aac agt ttt gta ata aaa aaa cct ata
 ttt att cat aaa atg aca aaa gca ttg tca aaa cat tat ttt ttt gga tat

205 aat att ccg gat tat tca tac cgt ccc acc atc ggg cgc gga tct cgg tcc
 tta taa ggc cta ata agt atg gca ggg tgg tag ccc gcg cct aga gcc agg

Met Ser Tyr Tyr His His His His His His Asp Tyr Asp Ile Pro
 256 gaa acc atg tgc tac tac cat cac cat cac cat cac gat tac gat atc cca
 ctt tgg tac agc atg atg gta gtg gla gtg gla gtg cta atg cta tag ggt

TEV protease

Thr Thr Glu Asn Leu Tyr Phe Gln Gly Ile Thr Ser Leu Tyr Lys Lys
 307 acg acc gaa aac ctg tat ttt cag ggc atc aca agt ttg tac aaa aaa gct
 tgc tgg ctt ttg gac ata aaa gtc ccg tag tgt tca aac atg ttt ttt ctc

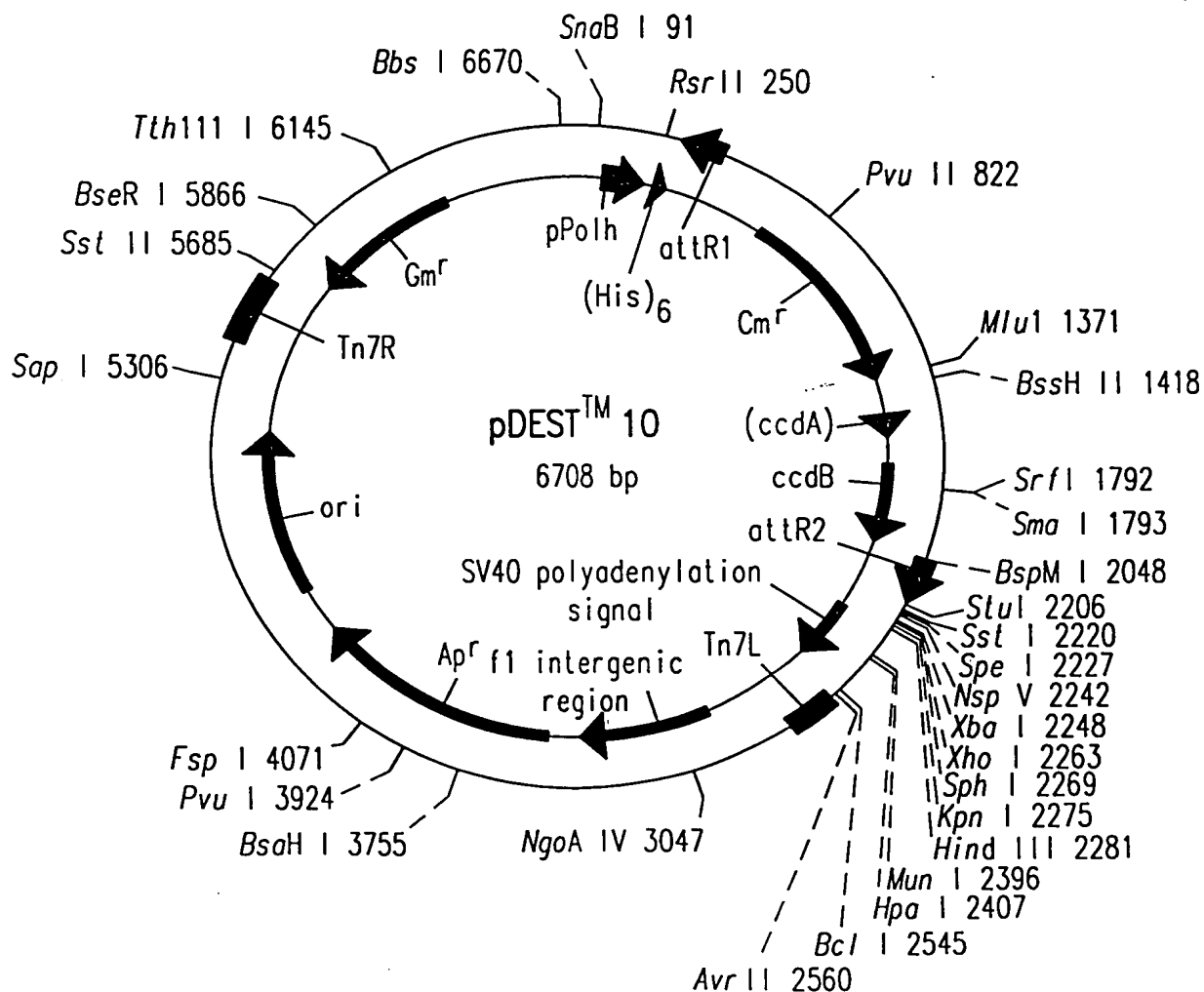


FIG.30A

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pDEST10 6708 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
23..152	Ppolh
461..337	attR1
711..1370	CmR
1490..1574	inactivated ccdA
1712..2017	ccdB
2058..2182	attR2
3394..4369	ampR
4510..5164	ori
5658..62	genR

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1  CCCC GGATGA AGTGGTTCGC ATCCTCGGTT TTCTGGAAGG CGAGCATCGT TTGTTGCCCC
61 AGGACTCTAG CTATAGTTCT AGTGGTTGGC TACGTATACT CCGGAATATT AATAGATCAT
121 GGAGATAATT AAAATGATAA CCATCTCGCA AATAAATAAG TATTTTACTG TTTTCGTAAC
181 AGTTTTGTAA TAAAAAAACC TATAAATATT CCGGATTATT CATACCGTCC CACCATCGGG
241 CGCGGATCTC GGTCCGAAAC CATGTCGTAC TACCATCACC ATCACCATCA CGATTACGAT
301 ATCCCAACGA CCGAAAACCT GTATTTTCAG GGCATCACAA GTTTGTACAA AAAAGCTGAA
361 CGAGAAACGT AAAATGATAT AAATATCAAT ATATTAAATT AGATTTTGCA TAAAAAACAG
421 ACTACATAAT ACTGTAAAAC ACAACATATC CAGTCACTAT GGCGGCCGCT AAGTTGGCAG
481 CATCACCCGA CGCACTTTGC GCCGAATAAA TACCTGTGAC GGAAGATCAC TTCGCAGAAT
541 AAATAAATCC TGGTGTCCCT GTTGATACCG GGAAGCCCTG GGCCAACTTT TGGCGAAAAT
601 GAGACGTTGA TCGGCACGTA AGAGGTTCCA ACTTTCACCA TAATGAAATA AGATCACTAC
661 CGGGCGTATT TTTTGAGTTA TCGAGATTTT CAGGAGCTAA GGAAGCTAAA ATGGAGAAAA
721 AAATCACTGG ATATACCACC GTTGATATAT CCCAATGGCA TCGTAAAGAA CATTTTGAGG
781 CATTTCAGTC AGTTGCTCAA TGTACCTATA ACCAGACCGT TCAGCTGGAT ATTACGGCCT
841 TTTTAAAGAC CGTAAAGAAA AATAAGCACA AGTTTTATCC GGCTTTTATT CACATTCTTG
901 CCCGCCTGAT GAATGCTCAT CCGGAATTCC GTATGGCAAT GAAAGACGGT GAGCTGGTGA
961 TATGGGATAG TGTTCAACCT TGTTACACCG TTTTCCATGA GCAAAC TGAA ACGTTTTTCAT
1021 CGCTCTGGAG TGAATACCAC GACGATTTCC GGCAGTTTCT ACACATATAT TCGCAAGATG
1081 TGGCGTGTTA CGGTGAAAAC CTGGCCTATT TCCCTAAAGG GTTTATTGAG AATATGTTTT
1141 TCGTCTCAGC CAATCCCTGG GTGAGTTTCA CCAGTTTTGA TTAAACGTG GCCAATATGG
1201 ACAACTTCTT CGCCCCCGTT TTCACCATGG GCAAATATTA TACGCAAGGC GACAAGGTGC
1261 TGATGCCGCT GGCGATT CAG GTTCATCATG CCGTCTGTGA TGGCTTCCAT GTCGGCAGAA
1321 TGCTTAATGA ATTACAACAG TACTGCGATG AGTGGCAGGG CGGGGCGTAA ACGCGTGGAT
1381 CCGGCTTACT AAAAGCCAGA TAACAGTATG CGTATTTGCG CGCTGATTTT TGCGGTATAA
1441 GAATATATAC TGATATGTAT ACCCGAAGTA TGTCAAAAAG AGGTGTGCTA TGAAGCAGCG
1501 TATTACAGTG ACAGTTGACA GCGACAGCTA TCAGTTGCTC AAGGCATATA TGATGTCAAT
1561 ATCTCCGGTC TGGTAAGCAC AACCATGCAG AATGAAGCCC GTCGTCTGCG TGCCGAACGC
1621 TGGAAAGCGG AAAATCAGGA AGGGATGGCT GAGGTCGCCC GGTTTATTGA AATGAACGGC
1681 TCTTTTGCTG ACGAGAACAG GGA CTGGTGA AATGCAGTTT AAGGTTTACA CCTATAAAAG
1741 AGAGAGCCGT TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA CGCCCGGGCG

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FIG.30B

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1801 ACGGATGGTG ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT CCCGTGAACT
1861 TTACCCGGTG GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG ATATGGCCAG
1921 TGTGCCGGTC TCCGTTATCG GGAAGAAGT GGCTGATCTC AGCCACCGCG AAAATGACAT
1981 CAAAAACGCC ATTAACCTGA TGTTCTGGGG AATATAAATG TCAGGCTCCC TTATACACAG
2041 CCAGTCTGCA GGTGACCAT AGTGACTGGA TATGTTGTGT TTTACAGTAT TATGTAGTCT
2101 GTTTTTTATG CAAAATCTAA TTTAATATAT TGATATTTAT ATCATTTTAC GTTTCTCGTT
2161 CAGCTTTCTT GTACAAAGTG GTGATGCCAT GGATCCGGAA TTCAAAGGCC TACGTCGACG
2221 AGCTCAACTA GTGCGGCCGC TTTCGAATCT AGAGCCTGCA GTCTCGAGGC ATGCGGTACC
2281 AAGCTTGTCG AGAAGTACTA GAGGATCATA ATCAGCCATA CCACATTTGT AGAGGTTTTA
2341 CTTGCTTTAA AAAACCTCCC ACACCTCCCC CTGAACCTGA AACATAAAAT GAATGCAATT
2401 GTTGTTGTTA ACTTGTTTAT TGCAGCTTAT AATGGTTACA AATAAAGCAA TAGCATCACA
2461 AATTTACAA ATAAAGCATT TTTTCACTG CATTCTAGTT GTGGTTTGTC CAAACTCATC
2521 AATGTATCTT ATCATGTCTG GATCTGATCA CTGCTTGAGC CTAGGAGATC CGAACCAGAT
2581 AAGTGAAATC TAGTTCCAAA CTATTTTGTC ATTTTAAATT TTCGTATTAG CTTACGACGC
2641 TACACCCAGT TCCCATCTAT TTTGTCACTC TTCCCTAAAT AATCCTTAAA AACTCCATTT
2701 CCACCCCTCC CAGTTCCCAA CTATTTTGTC CGCCACAGC GGGGCATTTT TCTTCCTGTT
2761 ATGTTTTTAA TCAAACATCC TGCCAACCTCC ATGTGACAAA CCGTCATCTT CGGCTACTTT
2821 TTCTCTGTCA CAGAAATGAAA ATTTTCTGT CATCTCTCG TTATTAATGT TTGTAATTGA
2881 CTGAATATCA ACGCTTATTT GCAGCCTGAA TGGCGAATGG GACGCGCCCT GTAGCGGCGC
2941 ATTAAGCGCG GCGGGTGTGG TGGTTACGCG CAGCGTGACC GCTACACTTG CCAGCGCCCT
3001 AGCGCCCGCT CCTTTCGCTT TCTTCCCTTC CTTTCTCGCC ACGTTCGCCG GCTTTCCCG
3061 TCAAGCTCTA AATCGGGGGC TCCCTTAGG GTTCCGATTT AGTGCTTTAC GGCACCTCGA
3121 CCCCCAAAAA CTTGATTAGG GTGATGGTTC ACGTAGTGGG CCATCGCCCT GATAGACGGT
3181 TTTTCGCCCT TTGACGTTGG AGTCCACGTT CTTTAATAGT GGACTCTTGT TCCAAACTGG
3241 AACAACTC AACCCTATCT CGGTCTATTC TTTTGATTTA TAAGGGATTT TGCCGATTTT
3301 GGCCTATTGG TTAATAAATG AGCTGATTTA AAAAAATTT AACGCGAATT TTAACAAAAT
3361 ATTAACGTTT ACAATTTTCA GTGGCACTTT TCGGGGAAAT GTGCGCGGAA CCCCTATTTG
3421 TTTATTTTTC TAAATACATT CAAATATGTA TCCGCTCATG AGACAATAAC CCTGATAAAT
3481 GCTTCAATAA TATTGAAAAA GGAAGAGTAT GAGTATTCAA CATTTCCGTG TCGCCCTTAT
3541 TCCCTTTTTT GCGGCATTTT GCCTTCCTGT TTTTGCTCAC CCAGAAACGC TGGTGAAAGT
3601 AAAAGATGCT GAAGATCAGT TGGGTGCACG AGTGGGTTAC ATCGAACTGG ATCTCAACAG
3661 CGGTAAGATC CTTGAGAGTT TTCGCCCGA AGAACGTTTT CCAATGATGA GCACTTTTAA
3721 AGTTCTGCTA TGTGGCGCGG TATTATCCCG TATTGACGCC GGGCAAGAGC AACTCGGTGC
3781 CCGCATACAC TATTCTCAGA ATGACTTGGT TGAGTACTCA CCAGTCACAG AAAAGCATCT
3841 TACGGATGGC ATGACAGTAA GAGAATTATG CAGTGCTGCC ATAACCATGA GTGATAACAC
3901 TGCGGCCAAC TTAATTCTGA CAACGATCGG AGGACCGAAG GAGCTAACCG CTTTTTTGCA
3961 CAACATGGGG GATCATGTAA CTCGCCTTGA TCGTTGGGAA CCGGAGCTGA ATGAAGCCAT
4021 ACCAAACGAC GAGCGTGACA CCACGATGCC TGTAGCAATG GCAACAACGT TGCGCCAACT
4081 ATTAACGGC GAACTACTTA CTCTAGCTTC CCGGCAACAA TTAATAGACT GGATGGAGGC
4141 GGATAAAGTT GCAGGACCAC TTCTGCGCTC GGCCCTTCCG GCTGGCTGGT TTATTGCTGA
4201 TAAATCTGGA GCCGGTGAGC GTGGGTCTCG CGGTATCATT GCAGCACTGG GGCCAGATGG

FIG.30C

4261 TAAGCCCTCC CGTATCGTAG TTATCTACAC GACGGGGAGT CAGGCAACTA TGGATGAACG
 4321 AAATAGACAG ATCGCTGAGA TAGGTGCCTC ACTGATTAAG CATTGGTAAC TGTCAGACCA
 4381 AGTTTACTCA TATATACTTT AGATTGATTT AAAACTTCAT TTTTAATTTA AAAGGATCTA
 4441 GGTGAAGATC CTTTTTGATA ATCTCATGAC CAAAATCCCT TAACGTGAGT TTTCGTTCCA
 4501 CTGAGCGTCA GACCCCGTAG AAAAGATCAA AGGATCTTCT TGAGATCCTT TTTTCTGCG
 4561 CGTAATCTGC TGCTTGCAAA CAAAAAACC ACCGCTACCA GCGGTGGTTT GTTTGCCGGA
 4621 TCAAGAGCTA CCAACTCTTT TTCCGAAGGT AACTGGCTTC AGCAGAGCGC AGATACCAAA
 4681 TACTGTCCTT CTAGTGTAGC CGTAGTTAGG CCACCACTTC AAGAACTCTG TAGCACCGCC
 4741 TACATACCTC GCTCTGCTAA TCCTGTTACC AGTGGCTGCT GCCAGTGGCG ATAAGTCGTG
 4801 TCTTACCGGG TTGGACTCAA GACGATAGTT ACCGGATAAG GCGCAGCGGT CGGGCTGAAC
 4861 GGGGGGTTTCG TGCACACAGC CCAGCTTGGA GCGAACGACC TACACCGAAC TGAGATACCT
 4921 ACAGCGTGAG CATTGAGAAA GCGCCACGCT TCCCGAAGGG AGAAAGGCGG ACAGGTATCC
 4981 GGTAAGCGGC AGGGTCGGAA CAGGAGAGCG CACGAGGGAG CTTCCAGGGG GAAACGCCTG
 5041 GTATCTTTAT AGTCCTGTCG GGTTTCGCCA CCTCTGACTT GAGCGTCGAT TTTTGTGATG
 5101 CTCGTCAGGG GGGCGGAGCC TATGGAAAAA CGCCAGCAAC GCGGCCTTTT TACGGTTCCT
 5161 GGCCTTTTGC TGGCCTTTTG CTCACATGTT CTTTCCTGCG TTATCCCTG ATTCTGTGGA
 5221 TAACCGTATT ACCGCCTTTG AGTGAGCTGA TACCGCTCGC CGCAGCCGAA CGACCGAGCG
 5281 CAGCGAGTCA GTGAGCGAGG AAGCGGAAGA GCGCCTGATG CGGTATTTTC TCCTTACGCA
 5341 TCTGTGCGGT ATTTACACCC GCAGACCAGC CGCGTAACCT GGCAAAATCG GTTACGGTTG
 5401 AGTAATAAAT GGATGCCCTG CGTAAGCGGG TGTGGGCGGA CAATAAAGTC TTAAACTGAA
 5461 CAAAATAGAT CTAAACTATG ACAATAAAGT CTTAAACTAG ACAGAATAGT TGTAAACTGA
 5521 AATCAGTCCA GTTATGCTGT GAAAAAGCAT ACTGGACTTT TGTTATGGCT AAAGCAAACCT
 5581 CTTCAATTTTC TGAAGTGCAA ATTGCCCGTC GTATTAAAGA GGGGCGTGGC CAAGGGCATG
 5641 GTAAAGACTA TATTCGCGGC GTTGTGACAA TTTACCGAAC AACTCCGCGG CCGGGAAGCC
 5701 GATCTCGGCT TGAACGAATT GTTAGGTGGC GGTACTTGGG TCGATATCAA AGTGCATCAC
 5761 TTCTTCCCGT ATGCCCAACT TTGTATAGAG AGCCACTGCG GGATCGTCAC CGTAATCTGC
 5821 TTGCACGTAG ATCACATAAG CACCAAGCGC GTTGGCCTCA TGCTTGAGGA GATTGATGAG
 5881 CGCGGTGGCA ATGCCCTGCC TCCGGTGCTC GCCGGAGACT GCGAGATCAT AGATATAGAT
 5941 CTCACTACGC GGCTGCTCAA ACCTGGGCAG AACGTAAGCC GCGAGAGCGC CAACAACCGC
 6001 TTCTTGGTCG AAGGCAGCAA GCGCGATGAA TGTCTTACTA CGGAGCAAGT TCCCGAGGTA
 6061 ATCGGAGTCC GGCTGATGTT GGGAGTAGGT GGCTACGTCT CCGAACTCAC GACCGAAAAG
 6121 ATCAAGAGCA GCCCGCATGG ATTTGACTTG GTCAGGGCCG AGCCTACATG TGCGAATGAT
 6181 GCCCATACTT GAGCCACCTA ACTTTGTTTT AGGGCGACTG CCCTGCTGCG TAACATCGTT
 6241 GCTGCTGCGT AACATCGTTG CTGCTCCATA ACATCAAACA TCGACCCACG GCGTAACGCG
 6301 CTTGCTGCTT GGATGCCCGA GGCATAGACT GTACAAAAAA ACAGTCATAA CAAGCCATGA
 6361 AAACCGCCAC TGCGCCGTTA CCACCGCTGC GTTCGGTCAA GGTTCTGGAC CAGTTGCGTG
 6421 AGCGCATACG CTAATTGCAT TACAGTTTAC GAACCGAACA GGCTTATGTC AACTGGGTTC
 6481 GTGCCTTCAT CCGTTTCCAC GGTGTGCGTC ACCCGGCAAC CTTGGGCAGC AGCGAAGTCG
 6541 AGGCATTTCT GTCCTGGCTG GCGAACGAGC GCAAGGTTTC GGTCTCCACG CATCGTCAGG
 6601 CATTGGCGGC CTTGCTGTTC TTCTACGGCA AGGTGCTGTG CACGGATCTG CCCTGGCTTC
 6661 AGGAGATCGG AAGACCTCGG CCGTCGCGGC GCTTGCCGGT GGTGCTGA

FIG.30D

TET-REGULATED EUKARYOTIC EXPRESSION

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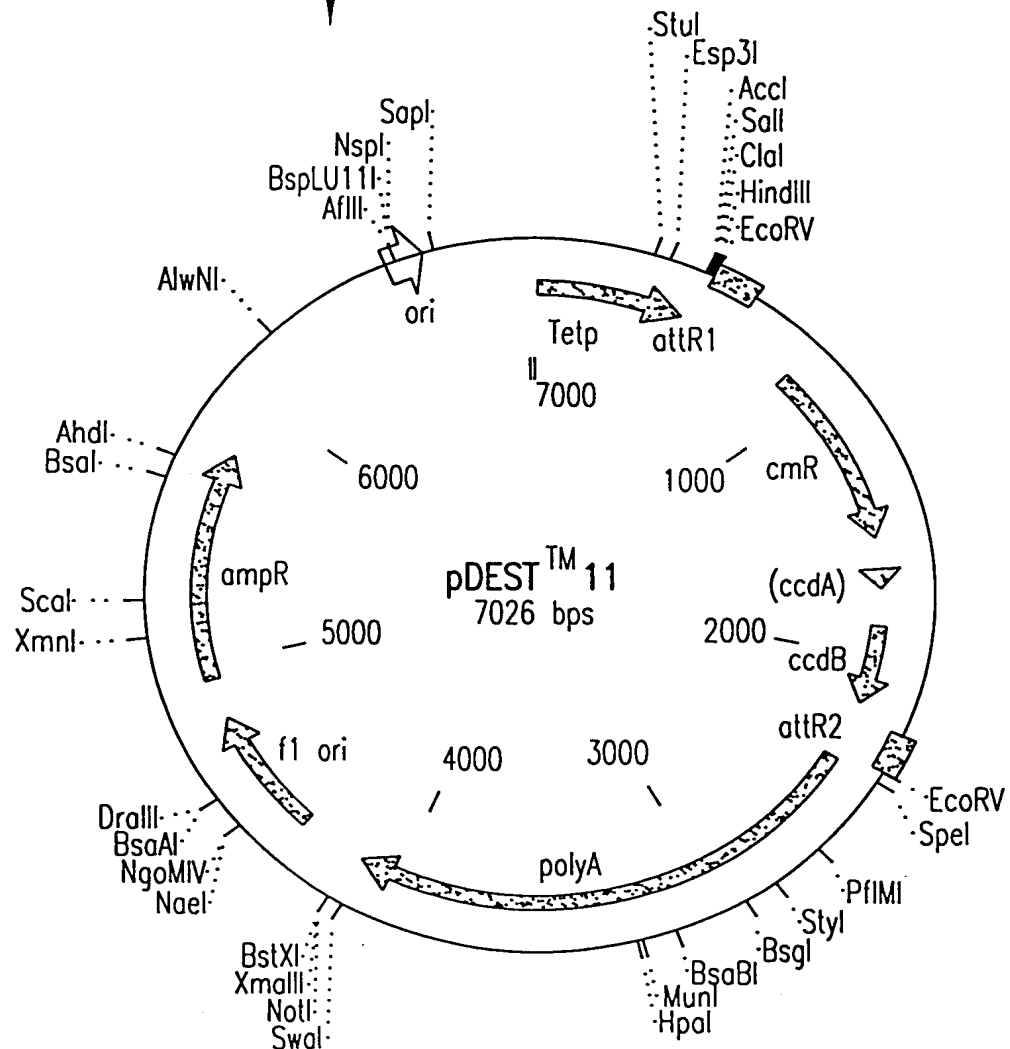
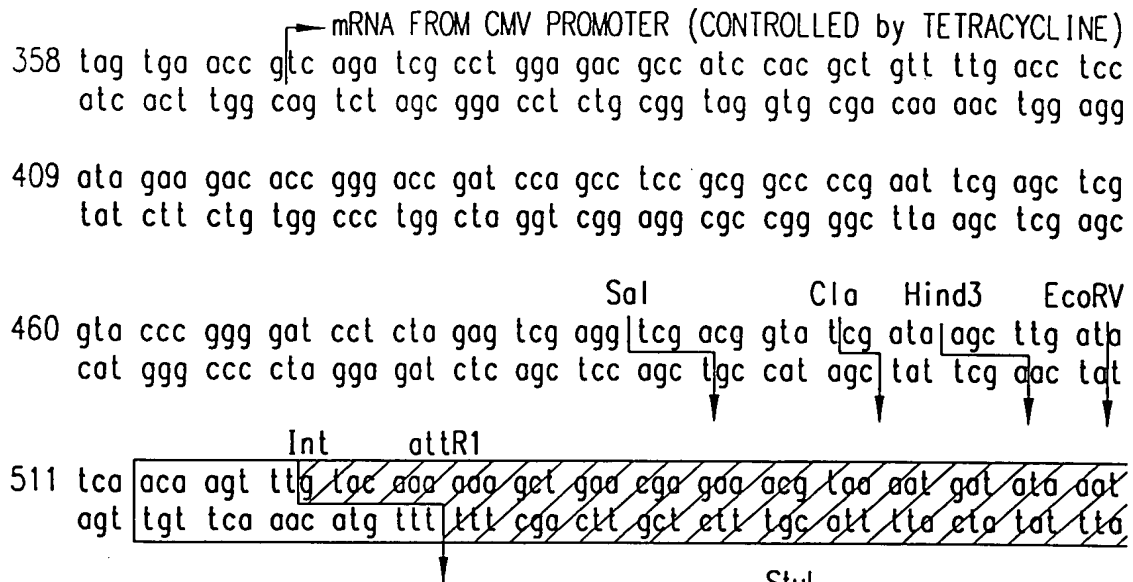


FIG.31A

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pDEST11 7026 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
4..479	Tetp ((Tet operator)7 and min hCMV promoter)
638..514	attR1
888..1547	CmR
1667..1751	inactivated ccdA
1889..2194	ccdB
2235..2359	attR2
2402..4132	polyA
4347..4803	f1 ori
4940..5797	ampR

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1  CGAGTTTACC ACTCCCTATC AGTGATAGAG AAAAGTGAAA GTCGAGTTTA CCACTCCCTA
61 TCAGTGATAG AGAAAAGTGA AAGTCGAGTT TACCACTCCC TATCAGTGAT AGAGAAAAGT
121 GAAAGTCGAG TTTACCACTC CCTATCAGTG ATAGAGAAAA GTGAAAGTCG AGTTTACCAC
181 TCCCTATCAG TGATAGAGAA AAGTGAAAGT CGAGTTTACC ACTCCCTATC AGTGATAGAG
241 AAAAGTGAAA GTCGAGTTTA CCACTCCCTA TCAGTGATAG AGAAAAGTGA AAGTCGAGCT
301 CGGTACCCGG GTCGAGTAGG CGTGTACGGT GGGAGGCCTA TATAAGCAGA GCTCGTTTAG
361 TGAACCGTCA GATCGCCTGG AGACGCCATC CACGCTGTTT TGACCTCCAT AGAAGACACC
421 GGGACCGATC CAGCCTCCGC GGCCCCGAAT TCGAGCTCGG TACCCGGGGA TCCTCTAGAG
481 TCGAGGTCGA CGGTATCGAT AAGCTTGATA TCAACAAGTT TGTACAAAAA AGCTGAACGA
541 GAAACGTAAA ATGATATAAA TATCAATATA TTAAATTAGA TTTTGCATAA AAAACAGACT
601 ACATAATACT GTAAACACAC ACATATCCAG TCACTATGGC GGCCGCTAAG TTGGCAGCAT
661 CACCCGACGC ACTTTGCGCC GAATAAATAC CTGTGACGGA AGATCACTTC GCAGAATAAA
721 TAAATCCTGG TGTCCCTGTT GATACCGGGA AGCCCTGGGC CAACTTTTGG CGAAAATGAG
781 ACGTTGATCG GCACGTAAGA GGTTCCAACT TTCACCATAA TGAAATAAGA TCACTACCGG
841 GCGTATTTTT TGAGTTATCG AGATTTTCAG GAGCTAAGGA AGCTAAAATG GAGAAAAAAA
901 TCACTGGATA TACCACCGTT GATATATCCC AATGGCATCG TAAAGAACAT TTTGAGGCAT
961 TTCAGTCAGT TGCTCAATGT ACCTATAACC AGACCGTTCA GCTGGATATT ACGGCCTTTT
1021 TAAAGACCGT AAAGAAAAAT AAGCACAAGT TTTATCCGGC CTTTATTCAC ATTCTTGCCC
1081 GCCTGATGAA TGCTCATCCG GAATTCCGTA TGGCAATGAA AGACGGTGAG CTGGTGATAT
1141 GGGATAGTGT TCACCCTTGT TACACCGTTT TCCATGAGCA AACTGAAACG TTTTCATCGC
1201 TCTGGAGTGA ATACCACGAC GATTTCCGGC AGTTTCTACA CATATATTCG CAAGATGTGG
1261 CGTGTTACGG TGAAAACCTG GCCTATTTCC CTAAAGGGTT TATTGAGAAT ATGTTTTTCG
1321 TCTCAGCCAA TCCCTGGGTG AGTTTCACCA GTTTTGATT AAACGTGGCC AATATGGACA
1381 ACTTCTTCGC CCCC GTTTT ACCATGGGCA AATATTATAC GCAAGGCGAC AAGGTGCTGA
1441 TGCCGCTGGC GATTCAGGT CATCATGCCG TCTGTGATGG CTTCCATGTC GGCAGAATGC
1501 TTAATGAATT ACAACAGTAC TGCGATGAGT GGCAGGGCGG GCGGTAAAGA TCTGGATCCG
1561 GCTTACTAAA AGCCAGATAA CAGTATGCGT ATTTGCGCGC TGATTTTTGC GGTATAAGAA

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FIG.31B

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1621 TATATACTGA TATGTATACC CGAAGTATGT CAAAAAGAGG TGTGCTATGA AGCAGCGTAT
1681 TACAGTGACA GTTGACAGCG ACAGCTATCA GTTGCTCAAG GCATATATGA TGTC AATATC
1741 TCCGGTCTGG TAAGCACAAC CATGCAGAAT GAAGCCCGTC GTCTGCGTGC CGAACGCTGG
1801 AAAGCGGAAA ATCAGGAAGG GATGGCTGAG GTCGCCCGGT TTATTGAAAT GAACGGCTCT
1861 TTTGCTGACG AGAACAGGGA CTGGTGAAAT GCAGTTTAAG GTTTACACCT ATAAAAGAGA
1921 GAGCCGTTAT CGTCTGTTTG TGGATGTACA GAGTGATATT ATTGACACGC CCGGGCGACG
1981 GATGGTGATC CCCCTGGCCA GTGCACGTCT GCTGTCAGAT AAAGTCTCCC GTGAACTTTA
2041 CCCGGTGGTG CATATCGGGG ATGAAAGCTG GCGCATGATG ACCACCGATA TGGCCAGTGT
2101 GCCGGTCTCC GTTATCGGGG AAGAAGTGGC TGATCTCAGC CACCGCGAAA ATGACATCAA
2161 AAACGCCATT AACCTGATGT TCTGGGGAAT ATAAATGTCA GGCTCCCTTA TACACAGCCA
2221 GTCTGCAGGT CGACCATAGT GACTGGATAT GTTGTGTTTT ACAGTATTAT GTAGTCTGTT
2281 TTTTATGCAA AATCTAATTT AATATATTGA TATTTATATC ATTTTACGTT TCTCGTTTCA
2341 CTTTCTTGTA CAAAGTGGTT GATATCGAAT TCCTGCAGCC CGGGGGATCC ACTAGTTCTA
2401 GAGCACTGCG ATGAGTGGCA GGGCGGGGCG TAATTTTTTT AAGGCAGTTA TTGGTGCCCT
2461 TAAACGCCTG GTGCTACGCC TGAATAAGTG ATAATAAGCG GATGAATGGC AGAAATTCGC
2521 CGGATCTTTG TGAAGGAACC TTAATTCTGT GGTGTGACAT AATTGGACAA ACTACCTACA
2581 GAGATTTAAA GCTCTAAGGT AAATATAAAA TTTTAAAGTG TATAATGTGT TAAACTACTG
2641 ATTCTAATTG TTTGTGTATT TTAGATTCCA ACCTATGGAA CTGATGAATG GGAGCAGTGG
2701 TGAATGCCT TTAATGAGGA AAACCTGTTT TGCTCAGAAG AAATGCCATC TAGTGATGAT
2761 GAGGCTACTG CTGACTCTCA ACATTCTACT CCTCCAAAAA AGAAGAGAAA GGTAGAAGAC
2821 CCCAAGGACT TTCCTTCAGA ATTGCTAAGT TTTTGTGAGT ATGCTGTGTT TAGTAATAGA
2881 ACTCTTGCTT GCTTTGCTAT TTACACCACA AAGGAAAAAG CTGCACTGCT ATACAAGAAA
2941 ATTATGGAAA AATATTCTGT AACCTTTATA AGTAGGCATA ACAGTTATAA TCATAACATA
3001 CTGTTTTTTC TTAATCCACA CAGGCATAGA GTGTCTGCTA TTAATAACTA TGCTCAAAAA
3061 TTGTGTACCT TTAGCTTTTT AATTTGTAAA GGGGTTAATA AGGAATATTT GATGTATAGT
3121 GCCTTGACTA GAGATCATAA TCAGCCATAC CACATTTGTA GAGGTTTTAC TTGCTTTAAA
3181 AAACCTCCCA CACCTCCCC TGAACCTGAA ACATAAAATG AATGCAATTG TTGTTGTAA
3241 CTTGTTTATT GCAGCTTATA ATGGTTACAA ATAAAGCAAT AGCATCACAA ATTTACAAA
3301 TAAAGCATT TTTTCACTGC ATTCTAGTTG TGGTTTGTCC AAACATCA ATGTATCTTA
3361 TCATGTCTGG ATCCCCAGGA AGTCCTCTG TGCTCTCATA AACCTAACC TCCTCTACTT
3421 GAGAGGACAT TCCAATCATA GGCTGCCCAT CCACCCTCTG TGCTCTCTG TTAATTAGGT
3481 CACTTAACAA AAAGGAAATT GGGTAGGGT TTTTCACAGA CCGCTTTCTA AGGGTAATTT
3541 TAAAATATCT GGGAAGTCCC TTCCACTGCT GTGTTCCAGA AGTGTGGTA AACAGCCCAC
3601 AAATGTCAAC AGCAGAAACA TACAAGCTGT CAGCTTTGCA CAAGGGCCCA ACACCCTGCT
3661 CATCAAGAAG CACTGTGGTT GCTGTGTTAG TAATGTGCAA AACAGGAGGC ACATTTTCCC
3721 CACCTGTGTA GGTTCCAAAA TATCTAGTGT TTTCATTTTT ACTTGGATCA GGAACCCAGC
3781 ACTCCACTGG ATAAGCATTA TCCTTATCCA AAACAGCCTT GTGGTCAGTG TTCATCTGCT
3841 GACTGTCAAC TGTAGCATTT TTTGGGGTTA CAGTTTGAGC AGGATATTTG GTCCTGTAGT

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FIG.31C

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3901 TTGCTAACAC ACCCTGCAGC TCCAAAGGTT CCCACCAAC AGCAAAAAAA TGAAAATTTG
3961 ACCCTTGAAT GGGTTTTCCA GCACCATTTT CATGAGTTTT TTGTGTCCCT GAATGCAAGT
4021 TTAACATAGC AGTTACCCCA ATAACCTCAG TTTTAACAGT AACAGCTTCC CACATCAAAA
4081 TATTTCCACA GGTTAAGTCC TCATTTAAAT TAGGCAAAGG AATTGCTCTA GAGCGGCCGC
4141 CACCGCGGTG GAGCTCCAAT TCGCCCTATA GTGAGTCGTA TTACGCGCGC TCACTGGCCG
4201 TCGTTTTACA ACGTCGTGAC TGGGAAAACC CTGGCGTTAC CCAACTTAAT CGCCTTGCAG
4261 CACATCCCCC TTTCGCCAGC TGGCGTAATA GCGAAGAGGC CCGCACCGAT CGCCCTTCCC
4321 AACAGTTGCG CAGCCTGAAT GGCGAATGGG ACGCGCCCTG TAGCGGCGCA TTAAGCGCGG
4381 CGGGTGTGGT GGTTACGCGC AGCGTGACCG CTACACTTGC CAGCGCCCTA GCGCCCGCTC
4441 CTTTCGCTTT CTTCCCTTCC TTTCTCGCÇA CGTTCGCCGG CTTTCCCCGT CAAGCTCTAA
4501 ATCGGGGGCT CCCTTTAGGG TTCCGATTTA GTGCTTTACG GCACCTCGAC CCCAAAAAAC
4561 TTGATTAGGG TGATGGTTCA CGTAGTGGGC CATCGCCCTG ATAGACGGTT TTTCGCCCTT
4621 TGACGTTGGA GTCCACGTTT TTTAATAGTG GACTCTTGTT CCAAAGTGA ACAACACTCA
4681 ACCCTATCTC GGTCTATTCT TTTGATTAT AAGGGATTTT GCCGATTTCG GCCTATTGGT
4741 TAAAAAATGA GCTGATTAA CAAAAATTA ACGCGAATTT TAACAAAATA TTAACGCTTA
4801 CAATTTAGGT GGCACTTTTT GGGGAAATGT GCGCGGAACC CCTATTTGTT TATTTTTCTA
4861 AATACATTCA AATATGTATC CGCTCATGAG ACAATAACCC TGATAAATGC TTCAATAATA
4921 TTGAAAAAGG AAGAGTATGA GTATTCAACA TTTCGTGTC GCCCTTATTC CCTTTTTTGC
4981 GGCATTTTGC CTTCTGTTT TTGCTCACCC AGAAACGCTG GTGAAAGTAA AAGATGCTGA
5041 AGATCAGTTG GGTGCACGAG TGGGTTACAT CGAACTGGAT CTCAACAGCG GTAAGATCCT
5101 TGAGAGTTTT CGCCCCGAAG AACGTTTTCC AATGATGAGC ACTTTTAAAG TTCTGCTATG
5161 TGGCGCGGTA TTATCCCGTA TTGACGCCGG GCAAGAGCAA CTCGGTCGCC GCATACACTA
5221 TTCTCAGAAT GACTTGGTTG AGTACTCACC AGTCACAGAA AAGCATCTTA CGGATGGCAT
5281 GACAGTAAGA GAATTATGCA GTGCTGCCAT AACCATGAGT GATAAACTG CGGCCAACTT
5341 ACTTCTGACA ACGATCGGAG GACCGAAGGA GCTAACCGCT TTTTGCACA ACATGGGGGA
5401 TCATGTAACT CGCCTTGATC GTTGGGAACC GGAGCTGAAT GAAGCCATAC CAAACGACGA
5461 GCGTGACACC ACGATGCCTG TAGCAATGGC AACAACGTTG CGCAAACAT TAACTGGCGA
5521 ACTACTTACT CTAGCTTCCC GGCAACAATT AATAGACTGG ATGGAGGCGG ATAAAGTTGC
5581 AGGACCACTT CTGCGCTCGG CCCTTCCGGC TGGCTGGTTT ATTGCTGATA AATCTGGAGC
5641 CGGTGAGCGT GGGTCTCGCG GTATCATTGC AGCACTGGGG CCAGATGGTA AGCCCTCCCG
5701 TATCGTAGTT ATCTACACGA CGGGGAGTCA GGCAACTATG GATGAACGAA ATAGACAGAT
5761 CGCTGAGATA GGTGCCTCAC TGATTAAGCA TTGGTAACTG TCAGACCAAG TTTACTCATA
5821 TATACTTTAG ATTGATTAA AACTTCATT TTAATTTAAA AGGATCTAGG TGAAGATCCT
5881 TTTTGATAAT CTCATGACCA AAATCCCTTA ACGTGAGTTT TCGTTCCACT GAGCGTCAGA
5941 CCCCGTAGAA AAGATCAAAG GATCTTCTTG AGATCCTTTT TTTCTGCGCG TAATCTGCTG
6001 CTTGCAAACA AAAAAACCAC CGCTACCAGC GGTGGTTTGT TTGCCGGATC AAGAGCTACC
6061 AACTCTTTTT CCGAAGGTAA CTGGCTTCAG CAGAGCGCAG ATACCAAATA CTGTCCTTCT
6121 AGTGTAGCCG TAGTTAGGCC ACCACTTCAA GAACTCTGTA GCACCGCCTA CATACCTCGC

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FIG.31D

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6181 TCTGCTAATC CTGTTACCAG TGGCTGCTGC CAGTGGCGAT AAGTCGTGTC TTACCGGGTT
6241 GGA CTCAAGA CGATAGTTAC CGGATAAGGC GCAGCGGTCG GGCTGAACGG GGGGTTTCGTG
6301 CACACAGCCC AGCTTGGAGC GAACGACCTA CACCGAACTG AGATACCTAC AGCGTGAGCT
6361 ATGAGAAAGC GCCACGCTTC CCGAAGGGAG AAAGGCGGAC AGGTATCCGG TAAGCGGCAG
6421 GGTCGGAACA GGAGAGCGCA CGAGGGAGCT TCCAGGGGGA AACGCCTGGT ATCTTTATAG
6481 TCCTGTCGGG TTTCGCCACC TCTGACTTGA GCGTCGATTT TTGTGATGCT CGTCAGGGGG
6541 GCGGAGCCTA TGGAAAAACG CCAGCAACGC GGCCTTTTTA CGGTTCTTGG CCTTTTGCTG
6601 GCCTTTTGCT CACATGTTCT TTCCTGCGTT ATCCCCTGAT TCTGTGGATA ACCGTATTAC
6661 CGCCTTTGAG TGAGCTGATA CCGCTCGCCG CAGCCGAACG ACCGAGCGCA GCGAGTCAGT
6721 GAGCGAGGAA GCGGAAGAGC GCCCAATACG CAAACCGCCT CTCCCCGCGC GTTGGCCGAT
6781 TCATTAATGC AGCTGGCACG ACAGGTTTCC CGACTGGAAA GCGGGCAGTG AGCGCAACGC
6841 AATTAATGTG AGTTAGCTCA CTCATTAGGC ACCCCAGGCT TTACACTTTA TGCTTCCGGC
6901 TCGTATGTTG TGTGGAATTG TGAGCGGATA ACAATTTAC ACAGGAAACA GCTATGACCA
6961 TGATTACGCC AAGCGCGCAA TTAACCCTCA CTAAAGGGAA CAAAAGCTGG GTACCGGGCC
7021 CCCCCT

FIG.31E

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pDEST12.2 CMV Promoter for Eukaryotic Expression, SV40
Promoter/ori for G418 Resistance

← mRNA from CMV promoter

307 acc gtc aga tcg cct gga gac gcc atc cac gct gtt ttg acc tcc ata gaa
tgg cag tct agc gga cct ctg cgg tag gtg cga caa aac tgg agg tat ctt

358 gac acc ggg acc gat cca gcc tcc gga ctc tag cct agg ccg cgg agc gga
ctg tgg ccc tgg cta ggt cgg agg cct gag atc gga tcc ggc gcc tcg cct

409 taa caa ttt cac aca gga aac agc tat gac cat tag gcc ttt gca aaa agc
att gtt aaa gtg tgt cct ttg tcg ata ctg gta atc cgg aaa cgt ttt tcg

460 tat tta ggt gac act ata gaa ggt acg cct gca ggt acc ggt ccg gaa ttc
ata aat cca ctg tga tat ctt cca tgc gga cgt cca tgg cca ggc ctt agg

511 cca tca aca agt ttg tac aaa aaa gct gaa cga gaa acg taa aat gat ata
ggg agt tgt tca aac atg ttt ttt cga ctt gct ctt tgc att tta cta tat

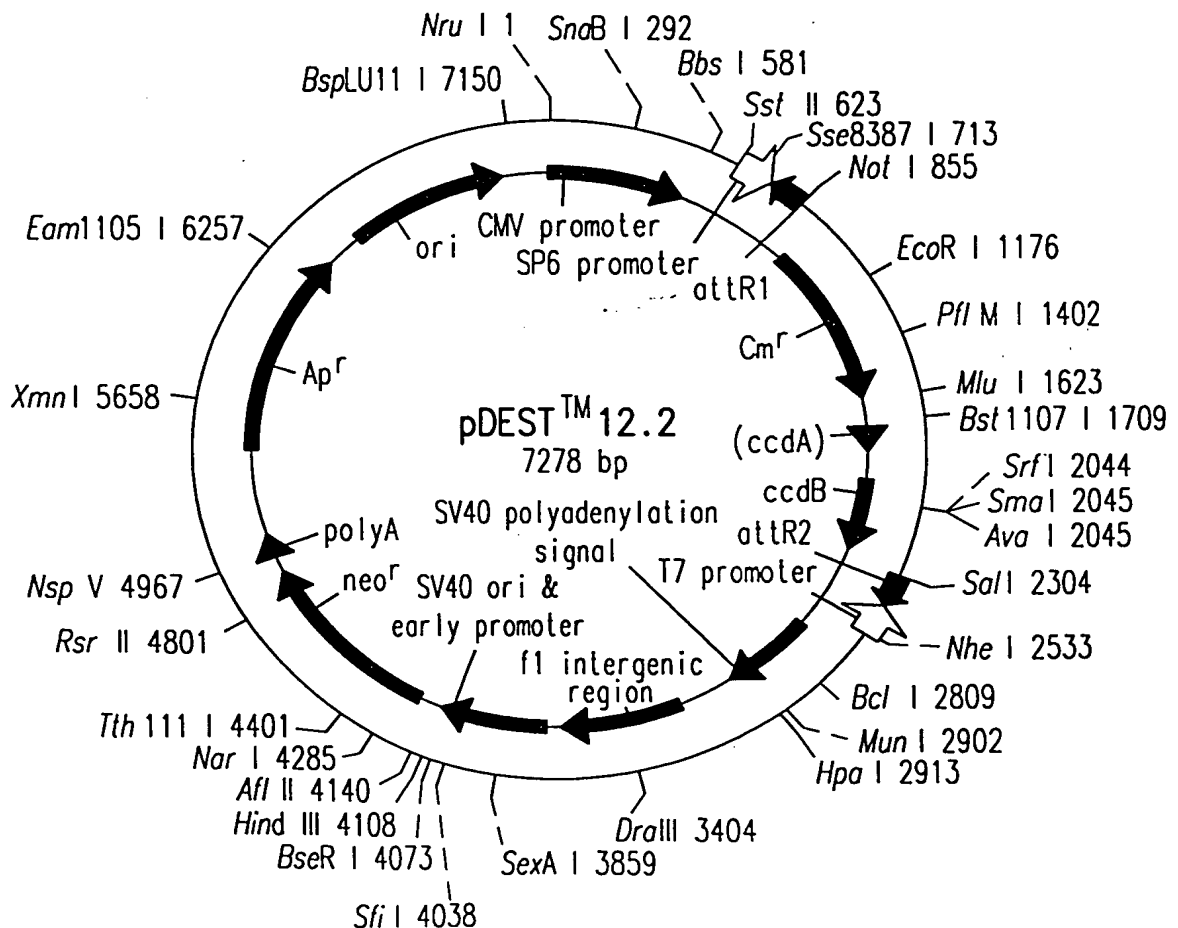


FIG.32A

pDEST12.2 7278 bp (rotated to position 3900)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
86..136	ori
220..742	CMV promoter
1059..935	attR1
1168..1827	CmR
1947..2031	inactivated ccdA
2169..2474	ccdB
2515..2639	attR2
2824..3186	small t & polyA
3310..3378	lac
4363..5157	neo
5680..6540	ampR

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1  GGGGGGCGGA GCCTATGGAA AAACGCCAGC AACGCGGCCT TTTTACGGTT CCTGGCCTTT
61 TGCTGGCCTT TTGCTCACAT GTTCTTTCCT GCGTTATCCC CTGATTCTGT GGATAACCGT
121 ATTACCGCCT TTGAGTGAGC TGATACCGCT CGCCGCAGCC GAACGACCGA GCGCAGCGAG
181 TCAGTGAGCG AGGAAGCGGA AGAGCTCGCG AATGCATGTC GTTACATAAC TTACGGTAAA
241 TGGCCCGCCT GGCTGACCGC CCAACGACCC CCGCCCATTG ACGTCAATAA TGACGTATGT
301 TCCCATAGTA ACGCCAATAG GGACTTTCCA TTGACGTCAA TGGGTGGAGT ATTTACGGTA
361 AACTGCCCAC TTGGCAGTAC ATCAAGTGTA TCATATGCCA AGTACGCCCC CTATTGACGT
421 CAATGACGGT AAATGGCCCG CCTGGCATTG TGCCCAGTAC ATGACCTTAT GGGACTTTCC
481 TACTTGGCAG TACATCTACG TATTAGTCAT CGCTATTACC ATGGTGATGC GGTTTTGGCA
541 GTACATCAAT GGGCGTGGAT AGCGGTTTGA CTCACGGGGA TTTCCAAGTC TCCACCCCAT
601 TGACGTCAAT GGGAGTTTGT TTTGGCACCA AAATCAACGG GACTTTCCAA AATGTCGTAA
661 CAACTCCGCC CCATTGACGC AAATGGGCGG TAGGCGTGTA CGGTGGGAGG TCTATATAAG
721 CAGAGCTCGT TTAGTGAACC GTCAGATCGC CTGGAGACGC CATCCACGCT GTTTTGACCT
781 CCATAGAAGA CACCGGGACC GATCCAGCCT CCGGACTCTA GCCTAGGCCG CGGGACGGAT
841 AACAATTTCA CACAGGAAAC AGCTATGACC ATTAGGCCTT TGCAAAAAGC TATTTAGGTG
901 AACTATAGA AGGTACGCCT GCAGGTACCG GATCACAAGT TTGTACAAAA AAGCTGAACG
961 AGAAACGTAA AATGATATAA ATATCAATAT ATTAATTTAG ATTTTGCATA AAAACAGAC
1021 TACATAATAC TGTA AACAC AACATATCCA GTCATATGG CGGCCGCATT AGGCACCCCA
1081 GGCTTTACAC TTTATGCTTC CGGCTCGTAT AATGTGTGGA TTTTGAGTTA GGATCCGTCG
1141 AGATTTTCAG GAGCTAAGGA AGCTAAAATG GAGAAAAAAA TCACTGGATA TACCACCGTT
1201 GATATATCCC AATGGCATCG TAAAGACAT TTTGAGGCAT TTCAGTCAGT TGCTCAATGT
1261 ACCTATAACC AGACCGTTCA GCTGGATATT ACGGCCTTTT TAAAGACCGT AAAGAAAAAT
1321 AAGCACAAGT TTTATCCGGC CTTTATTAC ATTCTTGCCC GCCTGATGAA TGCTCATCCG
1381 GAATTCCGTA TGGCAATGAA AGACGGTGAG CTGGTGATAT GGGATAGTGT TCACCCTTGT
1441 TACACCGTTT TCCATGAGCA AACTGAAACG TTTTCATCGC TCTGGAGTGA ATACCACGAC
1501 GATTTCCGGC AGTTTCTACA CATATATTCG CAAGATGTGG CGTGTACGG TGAAAACCTG
1561 GCCTATTTCC CTAAAGGGTT TATTGAGAAT ATGTTTTTCG TCTCAGCCAA TCCCTGGGTG

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FIG.32B

1621 AGTTTTCACCA GTTTTGATTT AAACGTGGCC AATATGGACA ACTTCTTCGC CCCC GTTTTC
 1681 ACCATGGGCA AATATTATAC GCAAGGCGAC AAGGTGCTGA TGCCGCTGGC GATT CAGGTT
 1741 CATCATGCCG TCTGTGATGG CTTCCATGTC GGCAGAATGC TTAATGAATT ACAACAGTAC
 1801 TGCGATGAGT GGCAGGGCGG GGCCTAAACG CGTGGATCCG GCTTACTAAA AGCCAGATAA
 1861 CAGTATGCGT ATTTGCGCGC TGATTTTTGC GGTATAAGAA TATATACTGA TATGTATACC
 1921 CGAAGTATGT CAAAAAGAGG TGTGCTATGA AGCAGCGTAT TACAGTGACA GTTGACAGCG
 1981 ACAGCTATCA GTTGCTCAAG GCATATATGA TGTCAATATC TCCGGTCTGG TAAGCACAAC
 2041 CATGCAGAAT GAAGCCCGTC GTCTGCGTGC CGAACGCTGG AAAGCGGAAA ATCAGGAAGG
 2101 GATGGCTGAG GTCGCCCGGT TTATTGAAAT GAACGGCTCT TTTGCTGACG AGAACAGGGA
 2161 CTGGTGAAAT GCAGTTTAAG GTTTACACCT ATAAAAGAGA GAGCCGTTAT CGTCTGTTTG
 2221 TGGATGTACA GAGTGATATT ATTGACACGC CCGGGCGACG GATGGTGATC CCCCTGGCCA
 2281 GTGCACGTCT GCTGTCAGAT AAAGTCTCCC GTGAACTTTA CCCGGTGGTG CATATCGGGG
 2341 ATGAAAGCTG GCGCATGATG ACCACCGATA TGGCCAGTGT GCCGGTCTCC GTTATCGGGG
 2401 AAGAAGTGGC TGATCTCAGC CACCGCGAAA ATGACATCAA AAACGCCATT AACCTGATGT
 2461 TCTGGGGAAT ATAAATGTCA GGCTCCCTTA TACACAGCCA GTCTGCAGGT CGACCATAGT
 2521 GACTGGATAT GTTGTGTTTT ACAGTATTAT GTAGTCTGTT TTTTATGCAA AATCTAATTT
 2581 AATATATTGA TATTTATATC ATTTTACGTT TCTCGTTCAG CTTTCTTGTA CAAAGTGGTG
 2641 ATCGCGTGCA TGCGACGTCA TAGCTCTCTC CCTATAGTGA GTCGTATTAT AAGCTAGGCA
 2701 CTGGCCGTCG TTTTACAACG TCGTGACTGG GAAAAC TGCT AGCTTGGGAT CTTTGTGAAG
 2761 GAACCTTACT TCTGTGGTGT GACATAATTG GACAACTAC CTACAGAGAT TTAAGCTCT
 2821 AAGGTAAATA TAAAATTTTT AAGTGTATAA TGTGTTAAAC TAGCTGCATA TGCTTGCTGC
 2881 TTGAGAGTTT TGCTTACTGA GTATGATTTA TGAAAATATT ATACACAGGA GCTAGTGATT
 2941 CTAATTGTTT GTGTATTTTA GATTCACAGT CCCAAGGCTC ATTT CAGGCC CCTCAGTCCT
 3001 CACAGTCTGT TCATGATCAT AATCAGCCAT ACCACATTTG TAGAGGTTTT ACTTGCTTTA
 3061 AAAAACCTCC CACACCTCCC CCTGAACCTG AAACATAAAA TGAATGCAAT TGTTGTTGTT
 3121 AACTTGTTTA TTGCAGCTTA TAATGGTTAC AAATAAAGCA ATAGCATCAC AAATTT CACA
 3181 AATAAAGCAT TTTTTTCACT GCATTCTAGT TGTGGTTTGT CCAAAC TCACT CAATGTATCT
 3241 TATCATGTCT GGATCGATCC TGCATTAATG AATCGGCCAA CGCGCGGGGA GAGGCGGTTT
 3301 GCGTATTGGC TGGCGTAATA GCGAAGAGGC CCGCACCGAT CGCCCTTCCC AACAGTTGCG
 3361 CAGCCTGAAT GGCGAATGGG ACGCGCCCTG TAGCGGCGCA TTAAGCGCGG CGGGTGTGGT
 3421 GGTACGCGC AGCGTGACCG CTACACTTGC CAGCGCCCTA GCGCCCGCTC CTTTCGCTTT
 3481 CTTCCCTTCC TTTCTCGCCA CGTTCGCCGG CTTTCCCGT CAAGCTCTAA ATCGGGGGCT
 3541 CCCTTTAGGG TTCCGATTTA GTGCTTTACG GCACCTCGAC CCCAAAAAAC TTGATTAGGG
 3601 TGATGGTTCA CGTAGTGGGC CATCGCCCTG ATAGACGGTT TTTCGCCCTT TGACGTTGGA
 3661 GTCCACGTTT TTTAATAGTG GACTCTTGTT CCAAAC TGGGA ACAACACTCA ACCCTATCTC
 3721 GGTCTATTCT TTTGATTTAT AAGGGATTTT GCCGATTTG GCCTATTGGT TAAAAAATGA
 3781 GCTGATTTAA CAAATATTTA ACGCGAATTT TAACAAAATA TTAACGTTTA CAATTT CGCC
 3841 TGATGCGGTA TTTTCTCCTT ACGCATCTGT GCGGTATTTT ACACCGCATA CGCGGATCTG
 3901 CGCAGCACCA TGGCCTGAAA TAACCTCTGA AAGAGGAACT TGGTTAGGTA CCTTCTGAGG
 3961 CGGAAAGAAC CAGCTGTGGA ATGTGTGTCA GTTAGGGTGT GGAAAGTCCC CAGGCTCCCC
 4021 AGCAGGCAGA AGTATGCAAA GCATGCATCT CAATTAGTCA GCAACCAGGT GTGGAAAGTC

FIG.32C

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4081	CCCAGGCTCC	CCAGCAGGCA	GAAGTATGCA	AAGCATGCAT	CTCAATTAGT	CAGCAACCAT
4141	AGTCCCGCCC	CTAACTCCGC	CCATCCCGCC	CCTAACTCCG	CCCAGTTCCG	CCCATTCTCC
4201	GCCCCATGGC	TGACTAATTT	TTTTTATTTA	TGCAGAGGCC	GAGGCCGCCT	CGGCCTCTGA
4261	GCTATTCCAG	AAGTAGTGAG	GAGGCTTTTT	TGGAGGCCTA	GGCTTTTGCA	AAAAGCTTGA
4321	TTCTTCTGAC	ACAACAGTCT	CGAACTTAAG	GCTAGAGCCA	CCATGATTGA	ACAAGATGGA
4381	TTGCACGCAG	GTTCTCCGGC	CGCTTGGGTG	GAGAGGCTAT	TCGGCTATGA	CTGGGCACAA
4441	CAGACAATCG	GCTGCTCTGA	TGCCGCCGTG	TTCCGGCTGT	CAGCGCAGGG	GCGCCCGGTT
4501	CTTTTTGTCA	AGACCGACCT	GTCCGGTGCC	CTGAATGAAC	TGCAGGACGA	GGCAGCGCGG
4561	CTATCGTGGC	TGGCCACGAC	GGGCGTTCCT	TGCGCAGCTG	TGCTCGACGT	TGTCACTGAA
4621	GCGGGAAGGG	ACTGGCTGCT	ATTGGGCGAA	GTGCCGGGGC	AGGATCTCCT	GTCATCTCAC
4681	CTTGCTCCTG	CCGAGAAAGT	ATCCATCATG	GCTGATGCAA	TGCGGCGGCT	GCATACGCTT
4741	GATCCGGCTA	CCTGCCCATT	CGACCACCAA	GCGAAACATC	GCATCGAGCG	AGCACGTACT
4801	CGGATGGAAG	CCGGTCTTGT	CGATCAGGAT	GATCTGGACG	AAGAGCATCA	GGGGCTCGCG
4861	CCAGCCGAAC	TGTTGCGCCAG	GCTCAAGGCG	CGCATGCCCG	ACGGCGAGGA	TCTCGTCGTG
4921	ACCCATGGCG	ATGCCTGCTT	GCCGAATATC	ATGGTGGAAG	ATGGCCGCTT	TTCTGGATTG
4981	ATCGACTGTG	GCCGGCTGGG	TGTGGCGGAC	CGCTATCAGG	ACATAGCGTT	GGCTACCCGT
5041	GATATTGCTG	AAGAGCTTGG	CGGCGAATGG	GCTGACCGCT	TCCTCGTGCT	TTACGGTATC
5101	GCCGCTCCCG	ATTCGCAGCG	CATCGCCTTC	TATCGCCTTC	TTGACGAGTT	CTTCTGAGCG
5161	GGACTCTGGG	GTTGCGAAATG	ACCGACCAAG	CGACGCCCAA	CCTGCCATCA	CGATGGCCGC
5221	AATAAAATAT	CTTTATTTTC	ATTACATCTG	TGTGTTGGTT	TTTTGTGTGA	ATCGATAGCG
5281	ATAAGGATCC	GCGTATGGTG	CACTCTCAGT	ACAATCTGCT	CTGATGCCGC	ATAGTTAAGC
5341	CAGCCCCGAC	ACCCGCCAAC	ACCCGCTGAC	GCGCCCTGAC	GGGCTTGTCT	GCTCCCGGCA
5401	TCCGCTTACA	GACAAGCTGT	GACCGTCTCC	GGGAGCTGCA	TGTGTCAGAG	GTTTTACCGG
5461	TCATCACCGA	AACGCGCGAG	ACGAAAGGGC	CTCGTGATAC	GCCTATTTTT	ATAGGTTAAT
5521	GTCATGATAA	TAATGGTTTC	TTAGACGTCA	GGTGGCACTT	TTCGGGGAAA	TGTGCGCGGA
5581	ACCCCTATTT	GTTTATTTTT	CTAAATACAT	TCAAATATGT	ATCCGCTCAT	GAGACAATAA
5641	CCCTGATAAA	TGCTTCAATA	ATATTGAAAA	AGGAAGAGTA	TGAGTATTCA	ACATTTCCGT
5701	GTCGCCCTTA	TTCCCTTTTT	TGCGGCATTT	TGCCCTTCTG	TTTTTGCTCA	CCCAGAAACG
5761	CTGGTGAAAG	TAAAAGATGC	TGAAGATCAG	TTGGGTGCAC	GAGTGGGTTA	CATCGAACTG
5821	GATCTCAACA	GCGGTAAGAT	CCTTGAGAGT	TTTCGCCCCG	AAGAAGCTTT	TCCAATGATG
5881	AGCACTTTTA	AAGTTCTGCT	ATGTGGCGCG	GTATTATCCC	GTATTGACGC	CGGGCAAGAG
5941	CAACTCGGTC	GCCGCATACA	CTATTCTCAG	AATGACTTGG	TTGAGTACTC	ACCAGTCACA
6001	GAAAAGCATC	TTACGGATGG	CATGACAGTA	AGAGAATTAT	GCAGTGCTGC	CATAACCATG
6061	AGTGATAACA	CTGCGGCCAA	CTTACTTCTG	ACAACGATCG	GAGGACCGAA	GGAGCTAACC
6121	GCTTTTTTTG	ACAACATGGG	GGATCATGTA	ACTCGCCTTG	ATCGTTGGGA	ACCGGAGCTG
6181	AATGAAGCCA	TACCAAACGA	CGAGCGTGAC	ACCACGATGC	CTGTAGCAAT	GGCAACAACG
6241	TTGCGCAAAC	TATTAAGTGG	CGAACTACTT	ACTCTAGCTT	CCCGGCAACA	ATTAATAGAC
6301	TGGATGGAGG	CGGATAAAGT	TGCAGGACCA	CTTCTGCGCT	CGGCCCTTCC	GGCTGGCTGG
6361	TTTATTGCTG	ATAAATCTGG	AGCCGGTGAG	CGTGGGTCTC	GCGGTATCAT	TGCAGCACTG
6421	GGGCCAGATG	GTAAGCCCTC	CCGTATCGTA	GTTATCTACA	CGACGGGGAG	TCAGGCAACT
6481	ATGGATGAAC	GAAATAGACA	GATCGCTGAG	ATAGGTGCCT	CACTGATTAA	GCATTGGTAA

FIG.32D

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6541 CTGTCAGACC AAGTTTACTC ATATATACTT TAGATTGATT TAAAACTTCA TTTTAAATTT
6601 AAAAGGATCT AGGTGAAGAT CCTTTTTGAT AATCTCATGA CCAAAATCCC TTAACGTGAG
6661 TTTTCGTTCC ACTGAGCGTC AGACCCCGTA GAAAAGATCA AAGGATCTTC TTGAGATCCT
6721 TTTTTTCTGC GCGTAATCTG CTGCTTGCAA ACAAAAAAAC CACCGCTACC AGCGGTGGTT
6781 TGTTTGCCGG ATCAAGAGCT ACCAACTCTT TTTCCGAAGG TAACTGGCTT CAGCAGAGCG
6841 CAGATACCAA ATACTGTCCT TCTAGTGTAG CCGTAGTTAG GCCACCACTT CAAGAACTCT
6901 GTAGCACCGC CTACATACCT CGCTCTGCTA ATCCTGTTAC CAGTGGCTGC TGCCAGTGGC
6961 GATAAGTCGT GTCTTACCGG GTTGGACTCA AGACGATAGT TACCGGATAA GGCGCAGCGG
7021 TCGGGCTGAA CGGGGGGTTC GTGCACACAG CCCAGCTTGG AGCGAACGAC CTACACCGAA
7081 CTGAGATACC TACAGCGTGA GCATTGAGAA AGCGCCACGC TTCCCGAAGG GAGAAAGGCG
7141 GACAGGTATC CGGTAAGCGG CAGGGTCGGA ACAGGAGAGC GCACGAGGGA GCTTCCAGGG
7201 GGAAACGCCT GGTATCTTTA TAGTCCTGTC GGGTTTCGCC ACCTCTGACT TGAGCGTCGA
7261 TTTTGTGAT GCTCGTCA

FIG.32E

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Native protein in E. coli: λP_L promoter

BgIII

3721 tgggcaaac aagacagcta aagatctctc acctaccaaa caatgcccc ctgcaaaaaa
 acccglttgg ttctgtcgal ttctagagag tggatggltt gttacggggg gacgtltttt

↓

3781 taatttcata taassaaacat acagataacc atctgcggtg ataaattatc tctggcggtg
 atttaagtat attttttgta tgtctattgg tagacgccac tatttaatag agaccgccac

-35 λP_L promoter -10 mRNA

3841 ttgacataaa taccactggc ggtgatcttg agcacatcag caggacgcac tgaccaccat
 aactgtatltt atggtgaccg ccactatgac tctgttagtc gtccctgcgtg actggltgta

EcoNI

3901 gaaggtagcg cttttaaaaa ttaagccctg aggaaggcca gcattcaaaag cagaaggcct
 ctccactgc gagaattttt aattcgggac ttcttccgt cgttaagttc gtcttccgaa

↓

Int attR1

3961 tgggggtgtg gatacgaac gaagcattgg gatcatcaca agtttgtaca aaaaagctga
 accccacaca ctatgtttg ctctgaacc ctagtatgt tcaaacatgt ttlttcgact

S

S

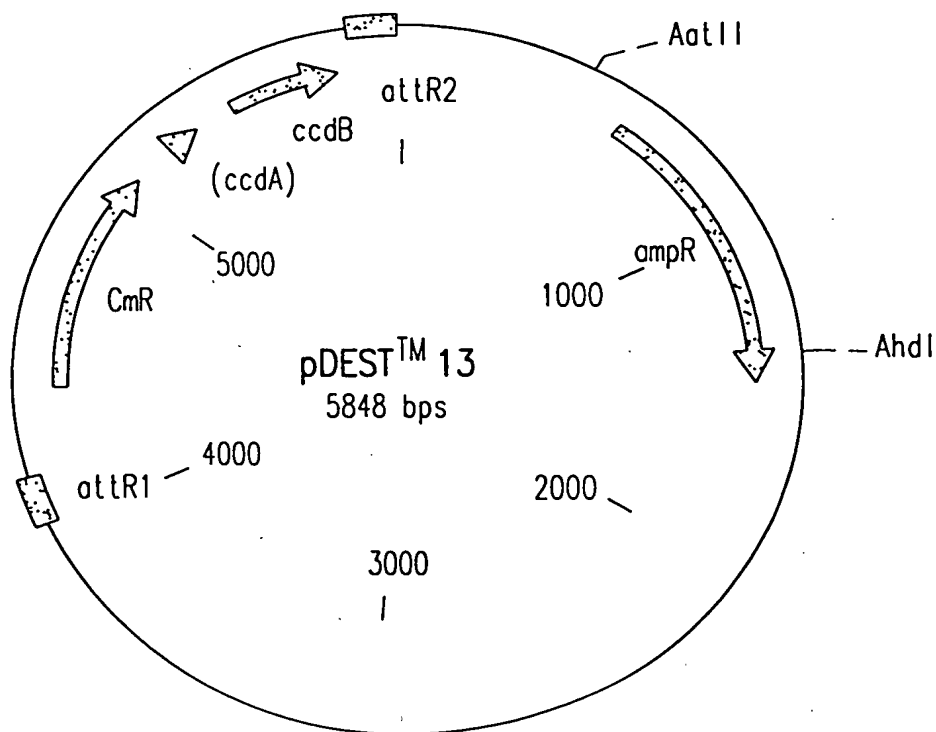


FIG.33A

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pDEST13 5848 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
599..1458	ampR
4123..3998	attR1
4372..5031	CmR
5151..5235	inactivated ccdA
5373..5678	ccdB
5719..5843	attR2

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1  TTCACTGGCC GTCGTTTTAC AACGTCGTGA CTGGGAAAAC CCTGGCGTTA CCCAACTTAA
61  TCGCCTTGCA GCACATCCCC CTTTCGCCAG CTGGCGTAAT AGCGAAGAGG CCCGCACCGA
121 TCGCCCTTCC CAACAGTTGC GCAGCCTGAA TGGCGAATGG CGCCTGATGC GGTATTTTCT
181 CCTTACGCAT CTGTGCGGTA TTTCACACCG CATATGGTGC ACTCTCAGTA CAATCTGCTC
241 TGATGCCGCA TAGTTAAGCC AGCCCCGACA CCCGCCAACA CCCGCTGACG CGCCCTGACG
301 GGCTTGTCTG CTCCCGGCAT CCGCTTACAG ACAAGCTGTG ACCGTCTCCG GGAGCTGCAT
361 GTGTCAGAGG TTTTCACCGT CATCACCGAA ACGCGCGAGA CGAAAGGGCC TCGTGATACG
421 CCTATTTTTA TAGGTTAATG TCATGATAAT AATGGTTTCT TAGACGTCAG GTGGCACTTT
481 TCGGGGAAAT GTGCGCGGAA CCCCTATTTG TTTATTTTTC TAAATACATT CAAATATGTA
541 TCCGCTCATG AGACAATAAC CCTGATAAAT GCTTCAATAA TATTGAAAAA GGAAGAGTAT
601 GAGTATTCOA CATTTCGGTG TCGCCCTTAT TCCCTTTTTT GCGGCATTTT GCCTTCCTGT
661 TTTTGCTCAC CCAGAAACGC TGGTGAAAGT AAAAGATGCT GAAGATCAGT TGGGTGCACG
721 AGTGGGTTAC ATCGAACTGG ATCTCAACAG CGGTAAGATC CTTGAGAGTT TTCGCCCCGA
781 AGAACGTTTT CCAATGATGA GCACTTTTAA AGTTCTGCTA TGTGGCGCGG TATTATCCCG
841 TATTGACGCC GGGCAAGAGC AACTCGGTCG CCGCATACAC TATTCTCAGA ATGACTTGGT
901 TGAGTACTCA CCAGTCACAG AAAAGCATCT TACGGATGGC ATGACAGTAA GAGAATTATG
961 CAGTGCTGCC ATAACCATGA GTGATAACAC TGCGGCCAAC TTA CTCTGA CAACGATCGG
1021 AGGACCGAAG GAGCTAACCG CTTTTTTGCA CAACATGGGG GATCATGTAA CTCGCCTTGA
1081 TCGTTGGGAA CCGGAGCTGA ATGAAGCCAT ACCAAACGAC GAGCGTGACA CCACGATGCC
1141 TGAGCAATG GCAACAACGT TGCGCAAACT ATTAAC TGGC GAAC TACTTA CTCTAGCTTC
1201 CCGGCAACAA TTAATAGACT GGATGGAGGC GGATAAAGTT GCAGGACCAC TTCTGCGCTC
1261 GGCCCTTCCG GCTGGCTGGT TTATTGCTGA TAAATCTGGA GCCGGTGAGC GTGGGTCTCG
1321 CGGTATCATT GCAGCACTGG GGCCAGATGG TAAGCCCTCC CGTATCGTAG TTATCTACAC
1381 GACGGGGAGT CAGGCAACTA TGGATGAACG AAATAGACAG ATCGCTGAGA TAGGTGCCTC
1441 ACTGATTAAG CATTGGTAAC TGTCAGACCA AGTTTACTCA TATATACTTT AGATTGATTT
1501 AAAACTTCAT TTTTAATTTA AAAGGATCTA GGTGAAGATC CTTTTTGATA ATCTCATGAC
1561 CAAAATCCCT TAACGTGAGT TTTCGTTCCA CTGAGCGTCA GACCCCGTAG AAAAGATCAA
1621 AGGATCTTCT TGAGATCCTT TTTTCTGCG CGTAATCTGC TGCTTGCAAA CAAAAAACC
1681 ACCGCTACCA GCGGTGGTTT GTTTGCCGGA TCAAGAGCTA CCAACTCTTT TTCCGAAGGT
1741 AACTGGCTTC AGCAGAGCGC AGATACCAAA TACTGTTCTT CTAGTGTAGC CGTAGTTAGG
1801 CCACCACTTC AAGAACTCTG TAGCACCGCC TACATACCTC GCTCTGCTAA TCCTGTTACC
1861 AGTGGCTGCT GCCAGTGGCG ATAAGTCGTG TCTTACGGG TTGGACTCAA GACGATAGTT

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FIG.33B

1921	ACCGGATAAG	GCGCAGCGGT	CGGGCTGAAC	GGGGGGTTTCG	TGCACACAGC	CCAGCTTGGA
1981	GCGAACGACC	TACACCGAAC	TGAGATACCT	ACAGCGTGAG	CATTGAGAAA	GCGCCACGCT
2041	TCCCGAAGGG	AGAAAGGCGG	ACAGGTATCC	GGTAAGCGGC	AGGGTCGGAA	CAGGAGAGCG
2101	CACGAGGGAG	CTTCCAGGGG	GAAACGCCTG	GTATCTTTAT	AGTCCTGTCTG	GGTTTCGCCA
2161	CCTCTGACTT	GAGCGTCGAT	TTTTGTGATG	CTCGTCAGGG	GGGCGGAGCC	TATGGAAAAA
2221	CGCCAGCAAC	GCGGCCTTTT	TACGGTTCCT	GGCCTTTTGC	TGGCCTTTTG	CTCACATGTT
2281	CTTTCCTGCG	TTATCCCCTG	ATTCTGTGGA	TAACCGTATT	ACCGCCTTTG	AGTGAGCTGA
2341	TACCGCTCGC	CGCAGCCGAA	CGACCGAGCG	CAGCGAGTCA	GTGAGCGAGG	AAGCGGAAGA
2401	GCGCCCAATA	CGCAAACCGC	CTCTCCCCGC	GCGTTGGCCG	ATTCATTAAT	GCAGCTGGCA
2461	CGACAGGTTT	CCCGACTGGA	AAGCGGGCAG	TGAGCGCAAC	GCAATTAATG	TGAGTTAGCT
2521	CACTCATTAG	GCACCCCAGG	CTTTACACTT	TATGCTTCCG	GCTCGTATGT	TGTGTGGAAT
2581	TGTGAGCGGA	TAACAATTTT	ACACAGGAAA	CAGCTATGAC	CATGATTACG	CCAAGCTTGG
2641	CTGCAGGTGA	TGATTATCAG	CCAGCAGAGA	TTAAGGAAAA	CAGACAGGTT	TATTGAGCGC
2701	TTATCTTTCC	CTTTATTTTT	GCTGCGGTAA	GTCGCATAAA	AACCATTCTT	CATAATTCAA
2761	TCCATTTACT	ATGTTATGTT	CTGAGGGGAG	TGAAAATTCC	CCTAATTCGA	TGAAGATTCT
2821	TGCTCAATTG	TTATCAGCTA	TGCGCCGACC	AGAACACCTT	GCCGATCAGC	CAAACGTCTC
2881	TTCAGGCCAC	TGACTAGCGA	TAACTTTCCC	CACAACGGAA	CAACTCTCAT	TGCATGGGAT
2941	CATTGGGTAC	TGTGGGTTTA	GTGGTTGTAA	AAACACCTGA	CCGCTATCCC	TGATCAGTTT
3001	CTTGAAGGTA	AACTCATCAC	CCCCAAGTCT	GGCTATGCAG	AAATCACCTG	GCTCAACAGC
3061	CTGCTCAGGG	TCAACGAGAA	TTAACATTCC	GTCAGGAAAG	CTTGGCTTGG	AGCCTGTTGG
3121	TGCGGTCATG	GAATTACCTT	CAACCTCAAG	CCAGAATGCA	GAATCACTGG	CTTTTTTGGT
3181	TGTGCTTACC	CATCTCTCCG	CATCACCTTT	GGTAAAGGTT	CTAAGCTTAG	GTGAGAACAT
3241	CCCTGCCTGA	ACATGAGAAA	AAACAGGGTA	CTCATACTCA	CTTCTAAGTG	ACGGCTGCAT
3301	ACTAACCGCT	TCATACATCT	CGTAGATTTT	TCTGGCGATT	GAAGGGCTAA	ATTCTTCAAC
3361	GCTAACTTTG	AGAATTTTTG	CAAGCAATGC	GGCGTTATAA	GCATTTAATG	CATTGATGCC
3421	ATTAAATAAA	GCACCAACGC	CTGACTGCCC	CATCCCCATC	TTGTCTGCGA	CAGATTCTTG
3481	GGATAAGCCA	AGTTCATTTT	TCTTTTTTTC	ATAAATTGCT	TTAAGGCGAC	GTGCGTCCTC
3541	AAGCTGCTCT	TGTGTTAATG	GTTTCTTTTT	TGTGCTCATA	CGTTAAATCT	ATCACCGCAA
3601	GGGATAAATA	TCTAACACCG	TGCGTGTTGA	CTATTTTACC	TCTGGCGGTG	ATAATGGTTG
3661	CATGTACTAA	GGAGGTTGTA	TGGAACAACG	CATAACCTTG	AAAGATTATG	CAATGCGCTT
3721	TGGGCAAACC	AAGACAGCTA	AAGATCTCTC	ACCTACCAAA	CAATGCCCCC	CTGCAAAAAA
3781	TAAATTCATA	TAAAAAACAT	ACAGATAACC	ATCTGCGGTG	ATAAATTATC	TCTGGCGGTG
3841	TTGACATAAA	TACCACTGGC	GGTGATACTG	AGCACATCAG	CAGGACGCAC	TGACCACCAT
3901	GAAGGTGACG	CTCTTAAAAA	TTAAGCCCTG	AAGAAGGGCA	GCATTCAAAG	CAGAAGGCTT
3961	TGGGGTGTGT	GATACGAAAC	GAAGCATTGG	GATCATCACA	AGTTTGTACA	AAAAAGCTGA
4021	ACGAGAAACG	TAAAATGATA	TAAATATCAA	TATATTAAAT	TAGATTTTGC	ATAAAAAACA
4081	GACTACATAA	TACTGTAAAA	CACAACATAT	CCAGTCACTA	TGGCGGCCGC	TAAGTTGGCA
4141	GCATCACCCG	ACGCACTTTG	CGCCGAATAA	ATACCTGTGA	CGGAAGATCA	CTTCGCAGAA
4201	TAAATAAATC	CTGGTGTCCC	TGTTGATACC	GGGAAGCCCT	GGGCCAACTT	TTGGCGAAAA
4261	TGAGACGTTG	ATCGGCACGT	AAGAGGTTCC	AACTTTCACC	ATAATGAAAT	AAGATCACTA
4321	CCGGGCGTAT	TTTTTGAGTT	ATCGAGATTT	TCAGGAGCTA	AGGAAGCTAA	AATGGAGAAA

FIG.33C

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4381 AAAATCACTG GATATACCAC CGTTGATATA TCCCAATGGC ATCGTAAAGA ACATTTTGAG
4441 GCATTTTCAGT CAGTTGCTCA ATGTACCTAT AACCAGACCG TTCAGCTGGA TATTACGGCC
4501 TTTTAAAGA CCGTAAAGAA AAATAAGCAC AAGTTTTATC CGGCCTTTAT TCACATTCTT
4561 GCCCGCCTGA TGAATGCTCA TCCGGAATTC CGTATGGCAA TGAAAGACGG TGAGCTGGTG
4621 ATATGGGATA GTGTTACACC TTGTTACACC GTTTTCCATG AGCAAACCTGA AACGTTTTCA
4681 TCGCTCTGGA GTGAATACCA CGACGATTC CGGCAGTTTC TACACATATA TTCGCAAGAT
4741 GTGGCGTGTT ACGGTGAAAA CCTGGCCTAT TTCCCTAAAG GGTTTATTGA GAATATGTTT
4801 TTCGTCTCAG CCAATCCCTG GGTGAGTTTC ACCAGTTTTG ATTTAAACGT GGCCAATATG
4861 GACAACCTCT TCGCCCCCGT TTTACCATTG GGCAAATATT ATACGCAAGG CGACAAGGTG
4921 CTGATGCCGC TGGCGATTCA GGTTCATCAT GCCGTCTGTG ATGGCTTCCA TGTCGGCAGA
4981 ATGCTTAATG AATTACAACA GTACTGCGAT GAGTGGCAGG GCGGGGCGTA AACGCGTGGA
5041 TCCGGCTTAC TAAAAGCCAG ATAACAGTAT GCGTATTTGC GCGCTGATTT TTGCGGTATA
5101 AGAATATATA CTGATATGTA TACCCGAAGT ATGTCAAAAA GAGGTGTGCT ATGAAGCAGC
5161 GTATTACAGT GACAGTTGAC AGCGACAGCT ATCAGTTGCT CAAGGCATAT ATGATGTCAA
5221 TATCTCCGGT CTGGTAAGCA CAACCATGCA GAATGAAGCC CGTCGTCTGC GTGCCGAACG
5281 CTGGAAAGCG GAAAATCAGG AAGGGATGGC TGAGGTCGCC CGGTTTATTG AAATGAACGG
5341 CTCTTTTGCT GACGAGAACA GGGACTGGTG AAATGCAGTT TAAGGTTTAC ACCTATAAAA
5401 GAGAGAGCCG TTATCGTCTG TTTGTGGATG TACAGAGTGA TATTATTGAC ACGCCCGGGC
5461 GACGGATGGT GATCCCCCTG GCCAGTGCAC GTCTGCTGTC AGATAAAGTC TCCCGTGAAC
5521 TTTACCCGGT GGTGCATATC GGGGATGAAA GCTGGCGCAT GATGACCACC GATATGGCCA
5581 GTGTGCCGGT CTCCGTTATC GGGGAAGAAG TGGCTGATCT CAGCCACCGC GAAAATGACA
5641 TCAAAAACGC CATTAACTG ATGTTCTGGG GAATATAAAT GTCAGGCTCC GTTATACACA
5701 GCCAGTCTGC AGGTCGACCA TAGTGACTGG ATATGTTGTG TTTTACAGTA TTATGTAGTC
5761 TGTTTTTTAT GCAAAATCTA ATTTAATATA TTGATATTTA TATCATTTTA CGTTTCTCGT
5821 TCAGCTTTCT TGTACAAAGT GGTGATAA

FIG.33D

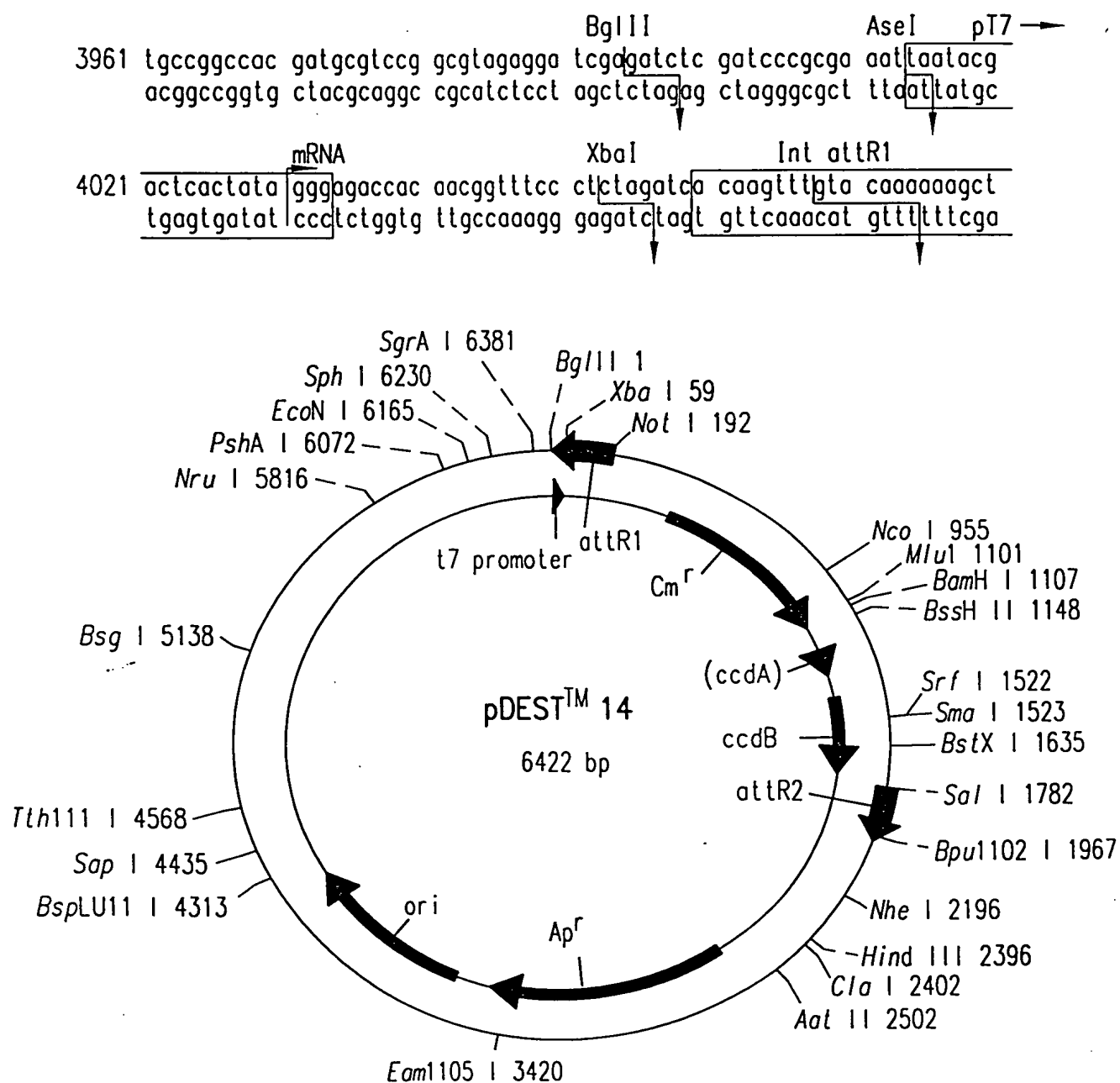
Native Protein Expression in *E. coli*, T7 Promoter

FIG.34A

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pDEST14 6422 bp (rotated to position 4000)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
185..61	attR1
435..1094	CmR
1214..1298	inactivated ccdA
1436..1741	ccdB
1782..1906	attR2
2632..3489	ampR

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1  CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC CCTCTAGATC
61  ACAAGTTTGT ACAAAAAAGC TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA
121 AATTAGATTT TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA
181 CTATGGCGGC CGCTAAGTTG GCAGCATCAC CCGACGCACT TTGCGCCGAA TAAATACCTG
241 TGACGGAAGA TCACTTCGCA GAATAAATAA ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC
301 CCTGGGCCAA CTTTTGGCGA AAATGAGACG TTGATCGGCA CGTAAGAGGT TCCAACTTTC
361 ACCATAATGA AATAAGATCA CTACCGGGCG TATTTTTTGA GTTATCGAGA TTTTCAGGAG
421 CTAAGGAAGC TAAAATGGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT
481 GGCATCGTAA AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA
541 CCGTTCAGCT GGATATTACG GCCTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT
601 ATCCGGCCTT TATTCACATT CTTGCCCGCC TGATGAATGC TCATCCGGAA TTCCGTATGG
661 CAATGAAAGA CGGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC
721 ATGAGCAAAC TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT
781 TTCTACACAT ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA
841 AAGGGTTTAT TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAGTT
901 TTGATTTAAA CGTGGCCAAT ATGGACAACT TCTTCGCCCC CGTTTTACAC ATGGGCAAAT
961 ATTATACGCA AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTTCAT CATGCCGTCT
1021 GTGATGGCTT CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC
1081 AGGGCGGGGC GTAAACGCGT GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT
1141 TGC GCGCTGA TTTTTCGGT ATAAGAATAT AACTGATAT GTATACCCGA AGTATGTCAA
1201 AAAGAGGTGT GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT
1261 GCTCAAGGCA TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA
1321 GCCCGTCGTC TGC GTGCCGA ACGCTGGAAA GCGGAAAATC AGGAAGGGAT GGCTGAGGTC
1381 GCCCGGTTTA TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA
1441 GTTTAAGGTT TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG
1501 TGATATTATT GACACGCCCG GGCGACGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT
1561 GTCAGATAAA GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG
1621 CATGATGACC ACCGATATGG CCAGTGTGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA
1681 TCTCAGCCAC CGCGAAAATG ACATCAAAAA CGCCATTAAC CTGATGTTCT GGGGAATATA
1741 AATGTCAGGC TCCCTTATAC ACAGCCAGTC TGCAGGTCGA CCATAGTGAC TGGATATGTT
1801 GTGTTTTACA GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT ATATTGATAT
1861 TTATATCATT TTACGTTTCT CGTTCAGCTT TCTTGTAACA AGTGGTGATG ATCCGGCTGC
1921 TAACAAAGCC CGAAAGGAAG CTGAGTTGGC TGCTGCCACC GCTGAGCAAT AACTAGCATA

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FIG.34B


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1981 ACCCCTTGGG GCCTCTAAAC GGGTCTTGAG GGGTTTTTTG CTGAAAGGAG GAACTATATC
2041 CGGATATCCA CAGGACGGGT GTGGTCGCCA TGATCGCGTA GTCGATAGTG GCTCCAAGTA
2101 GCGAAGCGAG CAGGACTGGG CGGCGGCCAA AGCGGTCGGA CAGTGCTCCG AGAACGGGTG
2161 CGCATAGAAA TTGCATCAAC GCATATAGCG CTAGCAGCAC GCCATAGTGA CTGGCGATGC
2221 TGTCGGAATG GACGATATCC CGCAAGAGGC CCGGCAGTAC CGGCATAACC AAGCCTATGC
2281 CTACAGCATC CAGGGTGACG GTGCCGAGGA TGACGATGAG CGCATTGTTA GATTTTCATC
2341 ACGGTGCCTG ACTGCGTTAG CAATTTAACT GTGATAAACT ACCGCATTAA AGCTTATCGA
2401 TGATAAGCTG TCAAACATGA GAATTCCTGA AGACGAAAGG GCCTCGTGAT ACGCCTATTT
2461 TTATAGGTTA ATGTCATGAT AATAATGGTT TCTTAGACGT CAGGTGGCAC TTTTCGGGGA
2521 AATGTGCGCG GAACCCCTAT TTGTTTATTT TTCTAAATAC ATTCAAATAT GTATCCGCTC
2581 ATGAGACAAT AACCTGATA AATGCTTCAA TAATATTGAA AAAGGAAGAG TATGAGTATT
2641 CAACATTTCC GTGTCGCCCT TATTCCTTT TTTGCGGCAT TTTGCCTTCC TGTTTTTGCT
2701 CACCCAGAAA CGCTGGTGAA AGTAAAAGAT GCTGAAGATC AGTTGGGTGC ACGAGTGGGT
2761 TACATCGAAC TGGATCTCAA CAGCGGTAAG ATCCTTGAGA GTTTTCGCCC CGAAGAACGT
2821 TTTCCAATGA TGAGCACTTT TAAAGTTCTG CTATGTGGCG CGGTATTATC CCGTGTTGAC
2881 GCCGGGCAAG AGCAACTCGG TCGCCGCATA CACTATTCTC AGAATGACTT GGTTGAGTAC
2941 TCACCAGTCA CAGAAAAGCA TCTTACGGAT GGCATGACAG TAAGAGAATT ATGCAGTGCT
3001 GCCATAACCA TGAGTGATAA CACTGCGGCC AACTTACTTC TGACAACGAT CGGAGGACCG
3061 AAGGAGCTAA CCGCTTTTTT GCACAACATG GGGGATCATG TAACTCGCCT TGATCGTTGG
3121 GAACCGGAGC TGAATGAAGC CATACCAAAC GACGAGCGTG ACACCACGAT GCCTGCAGCA
3181 ATGGCAACAA CGTTGCGCAA ACTATTAAC TGGCGAACTAC TTA CTCTAGC TTCCCGGCAA
3241 CAATTAATAG ACTGGATGGA GCGGATAAAA GTTGCAGGAC CACTTCTGCG CTCGGCCCTT
3301 CCGGCTGGCT GGTTTATTGC TGATAAATCT GGAGCCGGTG AGCGTGGGTC TCGCGGTATC
3361 ATTGCAGCAC TGGGGCCAGA TGGTAAGCCC TCCCGTATCG TAGTTATCTA CACGACGGGG
3421 AGTCAGGCAA CTATGGATGA ACGAAATAGA CAGATCGCTG AGATAGGTGC CTCACTGATT
3481 AAGCATTGGT AACTGTCAGA CCAAGTTTAC TCATATATAC TTTAGATTGA TTTAAACTT
3541 CATTTTAAAT TTAAGGAT CTAGGTGAAG ATCCTTTTTG ATAATCTCAT GACCAAAATC
3601 CCTTAACGTG AGTTTTCGTT CCACTGAGCG TCAGACCCCG TAGAAAAGAT CAAAGGATCT
3661 TCTTGAGATC CTTTTTTTCT GCGCGTAATC TGCTGCTTGC AAACAAAAAA ACCACCGCTA
3721 CCAGCGGTGG TTTGTTTGCC GGATCAAGAG CTACCAACTC TTTTCCGAA GGTAAGTGGC
3781 TTCAGCAGAG CGCAGATACC AAATACTGTC CTTCTAGTGT AGCCGTAGTT AGGCCACCAC
3841 TTCAAGAACT CTGTAGCACC GCCTACATAC CTCGCTCTGC TAATCCTGTT ACCAGTGGCT
3901 GCTGCCAGTG GCGATAAGTC GTGTCTTACC GGGTTGGACT CAAGACGATA GTTACCGGAT
3961 AAGGCGCAGC GGTCGGGCTG AACGGGGGGT TCGTGCACAC AGCCAGCTT GGAGCGAACG
4021 ACCTACACCG AACTGAGATA CCTACAGCGT GAGCTATGAG AAAGCGCCAC GCTTCCCGAA
4081 GGGAGAAAGG CGGACAGGTA TCCGGTAAGC GGCAGGGTCG GAACAGGAGA GCGCACGAGG
4141 GAGCTTCCAG GGGGAAACGC CTGGTATCTT TATAGTCCTG TCGGGTTTCG CCACCTCTGA
4201 CTTGAGCGTC GATTTTGTG ATGCTCGTCA GGGGGGCGGA GCCTATGGAA AAACGCCAGC
4261 AACGCGGCCT TTTTACGGTT CCTGGCCTTT TGCTGGCCTT TTGCTCACAT GTTCTTTCTT
4321 GCGTTATCCC CTGATTCTGT GGATAACCGT ATTACCGCCT TTGAGTGAGC TGATACCGCT
4381 CGCCGCAGCC GAACGACCGA GCGCAGCGAG TCAGTGAGCG AGGAAGCGGA AGAGCGCCTG

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FIG.34C

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4441 ATGCGGTATT TTCTCCTTAC GCATCTGTGC GGTATTTTAC ACCGCATATA TGGTGCACTC
4501 TCAGTACAAT CTGCTCTGAT GCCGCATAGT TAAGCCAGTA TACTACTCCGC TATCGCTACG
4561 TGA CTGGGTC ATGGCTGCGC CCCGACACCC GCCAACACCC GCTGACGCGC CCTGACGGGC
4621 TTGTCTGCTC CCGGCATCCG CTTACAGACA AGCTGTGACC GTCTCCGGGA GCTGCATGTG
4681 TCAGAGGTTT TCACCGTCAT CACCGAAACG CGCGAGGCAG CTGCGGTAAA GCTCATCAGC
4741 GTGGTCGTGA AGCGATTCAC AGATGTCTGC CTGTTCATCC GCGTCCAGCT CGTTGAGTTT
4801 CTCCAGAAGC GTTAATGTCT GGCTTCTGAT AAAGCGGGCC ATGTTAAGGG CGGTTTTTTC
4861 CTGTTTGGTC ACTGATGCCT CCGTGTAAGG GGGATTTCTG TTCATGGGGG TAATGATAAC
4921 GATGAAACGA GAGAGGATGC TCACGATACG GGTTACTGAT GATGAACATG CCCGGTTACT
4981 GGAACGTTGT GAGGGTAAAC AACTGGCGGT ATGGATGCGG CGGGACCAGA GAAAAATCAC
5041 TCAGGGTCAA TGCCAGCGCT TCGTTAATAC AGATGTAGGT GTTCCACAGG GTAGCCAGCA
5101 GCATCCTGCG ATGCAGATCC GGAACATAAT GGTGCAGGGC GCTGACTTCC GCGTTTCCAG
5161 ACTTTACGAA ACACGGAAAC CGAAGACCAT TCATGTTGTT GCTCAGGTCG CAGACGTTTT
5221 GCAGCAGCAG TCGCTTCACG TTCGCTCGCG TATCGGTGAT TCATTCTGCT AACCAGTAAG
5281 GCAACCCCGC CAGCCTAGCC GGGTCCTCAA CGACAGGAGC ACGATCATGC GCACCCGTGG
5341 CCAGGACCCA ACGCTGCCCG AGATGCGCCG CGTGCGGCTG CTGGAGATGG CGGACGCGAT
5401 GGATATGTTT TGCCAAGGGT TGGTTTGCGC ATTCACAGTT CTCCGCAAGA ATTGATTGGC
5461 TCCAATTCTT GGAGTGGTGA ATCCGTTAGC GAGGTGCCGC CGGCTTCCAT TCAGGTGCGAG
5521 GTGGCCCCGGC TCCATGCACC GCGACGCAAC GCGGGGAGGC AGACAAGGTA TAGGGCGGGC
5581 CCTACAATCC ATGCCAACCC GTTCCATGTG CTCGCCGAGG CGGCATAAAT CGCCGTGACG
5641 ATCAGCGGTC CAGTGATCGA AGTTAGGCTG GTAAGAGCCG CGAGCGATCC TTGAAGCTGT
5701 CCCTGATGGT CGTCATCTAC CTGCCTGGAC AGCATGGCCT GCAACGCGGG CATCCCGATG
5761 CCGCCGGAAG CGAGAAGAAT CATAATGGGG AAGGCCATCC AGCCTCGCGT CGCGAACGCC
5821 AGCAAGACGT AGCCCAGCGC GTCGGCCGCC ATGCCGGCGA TAATGGCCTG CTTCTCGCCG
5881 AAACGTTTGG TGGCGGGACC AGTGACGAAG GCTTGAGCGA GGGCGTGCAA GATTCCGAAT
5941 ACCGCAAGCG ACAGGCCGAT CATCGTCGCG CTCCAGCGAA AGCGGTCCTC GCCGAAAATG
6001 ACCCAGAGCG CTGCCGGCAC CTGTCTACG AGTTGCATGA TAAAGAAGAC AGTCATAAGT
6061 GCGGCGACGA TAGTCATGCC CCGCGCCCAC CGGAAGGAGC TGA CTGGGTT GAAGGCTCTC
6121 AAGGGCATCG GTCGATCGAC GCTCTCCCTT ATGCGACTCC TGCATTAGGA AGCAGCCCAG
6181 TAGTAGGTTG AGGCCGTTGA GCACCGCCGC CGCAAGGAAT GGTGCATGCA AGGAGATGGC
6241 GCCCAACAGT CCCCCGGCCA CGGGGCCTGC CACCATAACC ACGCCGAAAC AAGCGCTCAT
6301 GAGCCCGAAG TGGCGAGCCC GATCTTCCCC ATCGGTGATG TCGGCGATAT AGGCGCCAGC
6361 AACC GCACCT GTGGCGCCGG TGATGCCGGC CACGATGCGT CCGGCGTAGA GGATCGAGAT
6421 CT

FIG.34D

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pDest15 Glutathione-S-transferase Fusion in E. Coli, T7 Promoter mRNA

1 nat cga gat ctc gat ccc gcg aaa tta ata cga ctc act ata ggg aga cca
nta gct cta gag cta ggg cgc ttt aat tat gct gag tga tat ccc tct ggt

XbaI

52 caa cgg ttt ccc tct aga aat aat ttt gtt taa ctt taa gaa gga gat ata
ggt gcc aaa ggg aga tct tta tta aaa caa att gaa att ctt cct cta tat

NdeI M S P I L - - -

103 cat atg tcc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg caa ccc
gta tac agg gga tat gat cca ata acc ttt taa ttc ccg gaa cac gtt ggg

Start Translation GST

154 act cga ctt ctt ttg gaa tat ctt gaa gaa aaa tat gaa gag cat ttg tat
tga gct gaa gaa aac ctt ata gaa ctt ctt ttt ata ctt ctc gla aac ata

715 cag ggc tgg caa gcc acg ttt ggt ggt ggc gac cat cct cca aaa tgg gat
gtc ccg acc gtt cgg tgc aaa cca cca ccg ctg gla gga ggt ttt agc cta

- - - S N Q T S L Y K K A

766 ctg gtt ccg cgt cca tgg tgg aat caa aca agt ttg tac aaa aaa gct gaa
gac caa ggc gca ggt acc agc tta gtt tgt tca aac atg ttt ttt cga ctt

attR1 Int

817 cga gaa acg taa aat gat ata aat atc aat ata tta aat tag att ttg cat
gct ctt tgc att tta cta tat tta tag tta tat aat tta atc taa aac gla

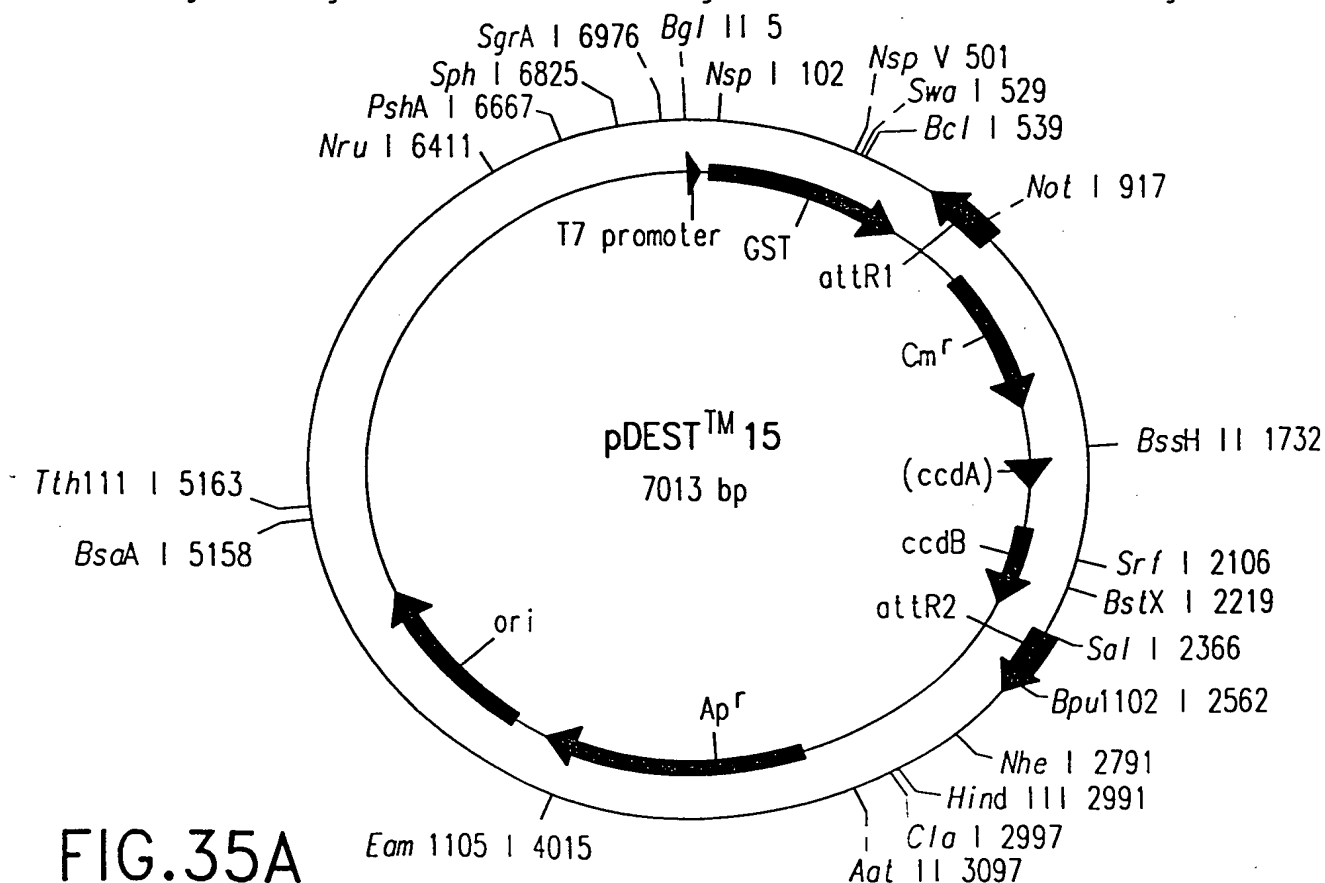


FIG.35A

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pDEST15 7013 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
108..776	GST
916..792	attR1
1025..1537	CmR
1804..1888	inactivated ccdA
2026..2331	ccdB
2372..2496	attR2
3233..4093	ampR

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1 ATCGAGATCT CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC
61 CCTCTAGAAA TAATTTTGTT TAACTTTAAG AAGGAGATAT ACATATGTCC CCTATACTAG
121 GTTATTGGAA AATTAAGGGC CTTGTGCAAC CCACTCGACT TCTTTTGGAA TATCTTGAAG
181 AAAAATATGA AGAGCATTTG TATGAGCGCG ATGAAGGTGA TAAATGGCGA AACAAAAAGT
241 TTGAATTGGG TTTGGAGTTT CCAATCTTC CTTATTATAT TGATGGTGAT GTTAAATTAA
301 CACAGTCTAT GGCCATCATA CGTTATATAG CTGACAAGCA CAACATGTTG GGTGGTTGTC
361 CAAAAGAGCG TGCAGAGATT TCAATGCTTG AAGGAGCGGT TTTGGATATT AGATACGGTG
421 TTTCGAGAAT TGCATATAGT AAAGACTTTG AAACCTCTCA AGTTGATTTT CTTAGCAAGC
481 TACCTGAAAT GCTGAAAATG TTCGAAGATC GTTTATGTCA TAAACATAT TTAAATGGTG
541 ATCATGTAAC CCATCCTGAC TTCATGTTGT ATGACGCTCT TGATGTTGTT TTATACATGG
601 ACCCAATGTG CCTGGATGCG TTCCCAAAT TAGTTTGTTT TAAAAAACGT ATTGAAGCTA
661 TCCCACAAAT TGATAAGTAC TTGAAATCCA GCAAGTATAT AGCATGGCCT TTGCAGGGCT
721 GGCAAGCCAC GTTTGGTGGT GGCAGCATC CTCCAAAATC GGATCTGGTT CCGCGTCCAT
781 GGTCGAATCA AACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAT GATATAAATA
841 TCAATATATT AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT AAAACACAAC
901 ATATCCAGTC ACTATGGCGG CCGCATTAGG CACCCAGGC TTTACACTTT ATGCTTCCGG
961 CTCGTATAAT GTGTGGATTT TGAGTTAGGA TCCGTCGAGA TTTTCAGGAG CTAAGGAAGC
1021 TAAAATGGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA
1081 AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT
1141 GGATATTACG GCCTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTT ATCCGGCCTT
1201 TATTCACATT CTTGCCCGCC TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA
1261 CGGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC ATGAGCAAAC
1321 TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT
1381 ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT
1441 TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAGT TTGATTTAAA
1501 CGTGGCCAAT ATGGACAAC TCTTCGCCCC CGTTTTACC ATGGGCAAAT ATTATACGCA
1561 AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTTAT CATGCCGTCT GTGATGGCTT
1621 CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC
1681 GTAATCTAGA GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT TGCGCGCTGA
1741 TTTTTCGGGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT
1801 GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA

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FIG.35B

1861	TATATGATGT	CAATATCTCC	GGTCTGGTAA	GCACAACCAT	GCAGAATGAA	GCCCGTCGTC
1921	TGCGTGCCGA	ACGCTGGAAA	GCGGAAAATC	AGGAAGGGAT	GGCTGAGGTC	GCCCGGTTTA
1981	TTGAAATGAA	CGGCTCTTTT	GCTGACGAGA	ACAGGGACTG	GTGAAATGCA	GTTTAAGGTT
2041	TACACCTATA	AAAGAGAGAG	CCGTTATCGT	CTGTTTGTGG	ATGTACAGAG	TGATATTATT
2101	GACACGCCCC	GGCGACGGAT	GGTGATCCCC	CTGGCCAGTG	CACGTCTGCT	GTCAGATAAA
2161	GTCTCCCGTG	AACTTTACCC	GGTGGTG CAT	ATCGGGGATG	AAAGCTGGCG	CATGATGACC
2221	ACCGATATGG	CCAGTGTGCC	GGTCTCCGTT	ATCGGGGAAG	AAGTGGCTGA	TCTCAGCCAC
2281	CGCGAAAATG	ACATCAAAAA	CGCCATTAAC	CTGATGTTCT	GGGGAATATA	AATGTCAGGC
2341	TCCCTTATAC	ACAGCCAGTC	TGCAGGTCGA	CCATAGTGAC	TGGATATGTT	GTGTTTTACA
2401	GTATTATGTA	GTCTGTTTTT	TATGCAAAAT	CTAATTTAAT	ATATTGATAT	TTATATCATT
2461	TTACGTTTCT	CGTTCAGCTT	TCTTGTACAA	AGTGGTTTGA	TTCGACCCGG	GATCCGGCTG
2521	CTAACAAAGC	CCGAAAGGAA	GCTGAGTTGG	CTGCTGCCAC	CGCTGAGCAA	TAAGTAGCAT
2581	AACCCCTTGG	GGCCTCTAAA	CGGGTCTTGA	GGGGTTTTTT	GCTGAAAGGA	GGAAGTATAT
2641	CCGGATATCC	ACAGGACGGG	TGTGGTCGCC	ATGATCGCGT	AGTCGATAGT	GGCTCCAAGT
2701	AGCGAAGCGA	GCAGGACTGG	GCGGCGGCCA	AAGCGGTCGG	ACAGTGCTCC	GAGAACGGGT
2761	GCGCATAGAA	ATTGCATCAA	CGCATATAGC	GCTAGCAGCA	CGCCATAGTG	ACTGGCGATG
2821	CTGTCGGAAT	GGACGATATC	CCGCAAGAGG	CCCGGCAGTA	CCGGCATAAC	CAAGCCTATG
2881	CCTACAGCAT	CCAGGGTGAC	GGTGCCGAGG	ATGACGATGA	GCGCATTGTT	AGATTTTATA
2941	CACGGTGCCT	GA CTGCGTTA	GCAATTTAAC	TGTGATAAAC	TACCGCATT A	AAGCTTATCG
3001	ATGATAAGCT	GTCAAACATG	AGAATTCTTG	AAGACGAAAG	GGCCTCGTGA	TACGCCTATT
3061	TTTATAGGTT	AATGTCATGA	TAATAATGGT	TTCTTAGACG	TCAGGTGGCA	CTTTTCGGGG
3121	AAATGTGCGC	GGAACCCCTA	TTTGTTTATT	TTTCTAAATA	CATTCAAATA	TGTATCCGCT
3181	CATGAGACAA	TAACCCTGAT	AAATGCTTCA	ATAATATTGA	AAAAGGAAGA	GTATGAGTAT
3241	TCAACATTTT	CGTGTGCCCC	TTATTCCCTT	TTTTGCGGCA	TTTTGCCTTC	CTGTTTTTGC
3301	TCACCCAGAA	ACGCTGGTGA	AAGTAAAAGA	TGCTGAAGAT	CAGTTGGGTG	CACGAGTGGG
3361	TTACATCGAA	CTGGATCTCA	ACAGCGGTAA	GATCCTTGAG	AGTTTTTCGCC	CCGAAGAACG
3421	TTTTCCAATG	ATGAGCACTT	TTAAAGTTCT	GCTATGTGGC	GCGGTATTAT	CCCGTGTTGA
3481	CGCCGGGCAA	GAGCAACTCG	GTCGCCGCAT	ACACTATTCT	CAGAATGACT	TGGTTGAGTA
3541	CTCACCAGTC	ACAGAAAAGC	ATCTTACGGA	TGGCATGACA	GTAAGAGAAT	TATGCAGTGC
3601	TGCCATAACC	ATGAGTGATA	ACACTGCGGC	CAACTTACTT	CTGACAACGA	TCGGAGGACC
3661	GAAGGAGCTA	ACCGCTTTTT	TGCACAACAT	GGGGGATCAT	GTAAGTACGCC	TTGATCGTTG
3721	GGAACCGGAG	CTGAATGAAG	CCATACCAAA	CGACGAGCGT	GACACCACGA	TGCCTGCAGC
3781	AATGGCAACA	ACGTTGCGCA	AAC TATTAAC	TGGCGA ACTA	CTTACTCTAG	CTTCCCGGCA
3841	ACAATTAATA	GA CTGGATGG	AGGCGGATAA	AGTTGCAGGA	CCACTTCTGC	GCTCGGCCCT
3901	TCCGGCTGGC	TGGTTTATTG	CTGATAAATC	TGGAGCCGGT	GAGCGTGGGT	CTCGCGGTAT
3961	CATTGCAGCA	CTGGGGCCAG	ATGGTAAGCC	CTCCCGTATC	GTAGTTATCT	ACACGACGGG
4021	GAGTCAGGCA	ACTATGGATG	AACGAAATAG	ACAGATCGCT	GAGATAGGTG	CCTCACTGAT
4081	TAAGCATTGG	TAAGTGTGAG	ACCAAGTTTA	CTCATATATA	CTTTAGATTG	ATTTAAAACT
4141	TCATTTTTTA	TTTAAAAGGA	TCTAGGTGAA	GATCCTTTTT	GATAATCTCA	TGACCAAAAT
4201	CCCTTAACGT	GAGTTTTTCG	TCCACTGAGC	GTCAGACCCC	GTAAGAAAAG	TCAAAGGATC
4261	TTCTTGAGAT	CCTTTTTTTC	TGCGCGTAAT	CTGCTGCTTG	CAAACAAAAA	AACCACCGCT

FIG.35C

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4321	ACCAGCGGTG	GTTTGTTC	CGGATCAAGA	GCTACCAACT	CTTTTCCGA	AGGTAAGTGG
4381	CTTCAGCAGA	GCGCAGATAC	CAAATACTGT	CCTTCTAGTG	TAGCCGTAGT	TAGGCCACCA
4441	CTTCAAGAAC	TCTGTAGCAC	CGCCTACATA	CCTCGCTCTG	CTAATCCTGT	TACCAGTGGC
4501	TGCTGCCAGT	GGCGATAAGT	CGTGTCTTAC	CGGGTTGGAC	TCAAGACGAT	AGTTACCGGA
4561	TAAGGCGCAG	CGGTCGGGCT	GAACGGGGGG	TTCGTGCACA	CAGCCCAGCT	TGGAGCGAAC
4621	GACCTACACC	GAAGTGAGAT	ACCTACAGCG	TGAGCTATGA	GAAAGCGCCA	CGCTTCCCGA
4681	AGGGAGAAAG	GCGGACAGGT	ATCCGGTAAG	CGGCAGGGTC	GGAACAGGAG	AGCGCACGAG
4741	GGAGCTTCCA	GGGGGAAACG	CCTGGTATCT	TTATAGTCCT	GTCGGGTTTC	GCCACCTCTG
4801	ACTTGAGCGT	CGATTTTTGT	GATGCTCGTC	AGGGGGGCGG	AGCCTATGGA	AAAACGCCAG
4861	CAACGCGGCC	TTTTTACGGT	TCCTGGCCTT	TTGCTGGCCT	TTTGCTCACA	TGTTCTTTCC
4921	TGCGTTATCC	CCTGATTCTG	TGGATAACCG	TATTACCGCC	TTTGAGTGAG	CTGATACCGC
4981	TCGCCGCAGC	CGAACGACCG	AGCGCAGCGA	GTCAGTGAGC	GAGGAAGCGG	AAGAGCGCCT
5041	GATGCGGTAT	TTTCTCCTTA	CGCATCTGTG	CGGTATTTCA	CACCGCATAT	ATGGTGCACCT
5101	CTCAGTACAA	TCTGCTCTGA	TGCCGCATAG	TTAAGCCAGT	ATACACTCCG	CTATCGCTAC
5161	GTGACTGGGT	CATGGCTGCG	CCCCGACACC	CGCCAACACC	CGCTGACGCG	CCCTGACGGG
5221	CTTGTCTGCT	CCCGGCATCC	GCTTACAGAC	AAGCTGTGAC	CGTCTCCGGG	AGCTGCATGT
5281	GTCAGAGGTT	TTCACCGTCA	TCACCGAAAC	GCGCGAGGCA	GCTGCGGTAA	AGCTCATCAG
5341	CGTGGTCGTG	AAGCGATTCA	CAGATGTCTG	CCTGTTTCATC	CGCGTCCAGC	TCGTTGAGTT
5401	TCTCCAGAAG	CGTTAATGTC	TGGCTTCTGA	TAAAGCGGGC	CATGTTAAGG	GCGGTTTTTT
5461	CCTGTTTGGT	CACTGATGCC	TCCGTGTAAG	GGGGATTTCT	GTTTCATGGG	GTAATGATAC
5521	CGATGAAACG	AGAGAGGATG	CTCACGATAC	GGGTTACTGA	TGATGAACAT	GCCCGGTTAC
5581	TGGAACGTTG	TGAGGGTAAA	CAACTGGCGG	TATGGATGCG	GCGGGACCAG	AGAAAAATCA
5641	CTCAGGGTCA	ATGCCAGCGC	TTCGTTAATA	CAGATGTAGG	TGTTCCACAG	GGTAGCCAGC
5701	AGCATCCTGC	GATGCAGATC	CGGAACATAA	TGGTGCAGGG	CGCTGACTTC	CGCGTTTCCA
5761	GACTTTACGA	AACACGGAAA	CCGAAGACCA	TTCATGTTGT	TGCTCAGGTC	GCAGACGTTT
5821	TGCAGCAGCA	GTCGCTTCAC	GTTGCTCGC	GTATCGGTGA	TTCATTCTGC	TAACCAAGTAA
5881	GGCAACCCCG	CCAGCCTAGC	CGGGTCCTCA	ACGACAGGAG	CACGATCATG	CGCACCCGTG
5941	GCCAGGACCC	AACGCTGCCC	GAGATGCGCC	GCGTGCGGCT	GCTGGAGATG	GCGGACGCGA
6001	TGGATATGTT	CTGCCAAGGG	TTGGTTTGCG	CATTCACAGT	TCTCCGCAAG	AATTGATTGG
6061	CTCCAATTCT	TGGAGTGGTG	AATCCGTTAG	CGAGGTGCCG	CCGGCTTCCA	TTCAGGTCGA
6121	GGTGGCCCGG	CTCCATGCAC	CGCGACGCAA	CGCGGGGAGG	CAGACAAGGT	ATAGGGCGGC
6181	GCCTACAATC	CATGCCAACC	CGTTCCATGT	GCTCGCCGAG	GCGGCATAAA	TCGCCGTGAC
6241	GATCAGCGGT	CCAGTGATCG	AAGTTAGGCT	GGTAAGAGCC	GCGAGCGATC	CTTGAAGCTG
6301	TCCCTGATGG	TCGTCATCTA	CCTGCCTGGA	CAGCATGGCC	TGCAACGCGG	GCATCCCGAT
6361	GCCGCCGGAA	GCGAGAAGAA	TCATAATGGG	GAAGGCCATC	CAGCCTCGCG	TCGCGAACGC
6421	CAGCAAGACG	TAGCCCAGCG	CGTCGGCCGC	CATGCCGGCG	ATAATGGCCT	GCTTCTCGCC
6481	GAAACGTTTG	GTGGCGGGAC	CAGTGACGAA	GGCTTGAGCG	AGGGCGTGCA	AGATTCCGAA
6541	TACCGCAAGC	GACAGGCCGA	TCATCGTCGC	GCTCCAGCGA	AAGCGGTCTT	CGCCGAAAAT
6601	GACCCAGAGC	GCTGCCGGCA	CCTGTCCTAC	GAGTTGCATG	ATAAAGAAGA	CAGTCATAAG
6661	TGCGGCGACG	ATAGTCATGC	CCCGCGCCCA	CCGGAAGGAG	CTGACTGGGT	TGAAGGCTCT
6721	CAAGGGCATC	GGTCGATCGA	CGCTCTCCCT	TATGCGACTC	CTGCATTAGG	AAGCAGCCCA
6781	GTAGTAGGTT	GAGGCCGTTG	AGCACCGCCG	CCGCAAGGAA	TGGTGCATGC	AAGGAGATGG
6841	CGCCCAACAG	TCCCCCGGCC	ACGGGGCCTG	CCACCATAAC	CACGCCGAAA	CAAGCGCTCA
6901	TGAGCCCGAA	GTGGCGAGCC	CGATCTTCCC	CATCGGTGAT	GTCGGCGATA	TAGGCGCCAG
6961	CAACCGCACC	TGTGGCGCCG	GTGATGCCGG	CCACGATGCG	TCCGGCGTAG	AGG

FIG.35D

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Thioredoxin N-Fusion Protein in E. coli with T7 Promoter

T7 Promoter mRNA

```

1  gat ctc gat ccc gcg aaa tta ata cga ctc act ata ggg aga cca caa cgg
   cta gag cta ggg cgc ttt oot tat gct gag tga tat ccc tct ggt gtt gcc

52  ttt ccc tct aga aat aat ttt gtt taa ctt taa gaa gga gat ata cat atg Start
   aaa ggg aga tct tta tta aaa caa att gaa att ctt cct cta tat gta tac Translation Trx

S D K - - -

103 agc gat aaa att att cac ctg act gac gac agt ttt gac acg gat gla ctc
    tcg cta ttt taa taa glg gac tga ctg ctg tca aaa ctg tgc cta cat gag

358 glg gcg gca acc aaa glg ggt gca ctg tct aaa ggt cag ttg aaa gag ttc
    cac cgc cgt tgg ttt cac cca cgt gac aga ttt cca glc aac ttt ctc aag

- - - G D D D D K I

409 ctc gac gct aac ctg gcc ggt tct ggt tct ggt gat gac gat gac aag atc
    gag ctg cga ttg gac cgg cca aga cca aga cca cta ctg cta ctg ttc tag

T S L Y K K A attR1
460 aca agt ttg tac aaa aaa gct gaa cga gaa acg taa aat gat ata aat atc
    tgt tca aac atg ttt ttt cga ctt gct ctt tgc att tta cta tat tta tag
  
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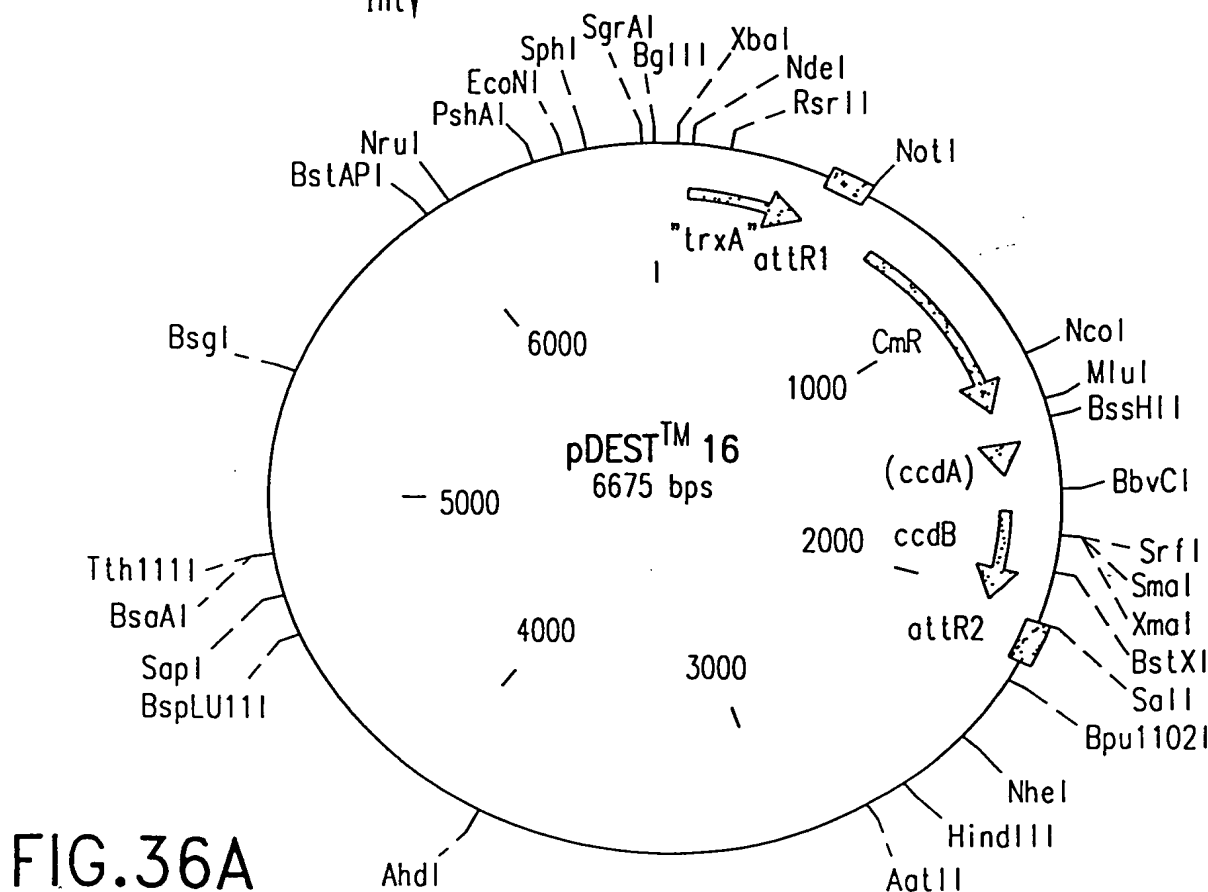


FIG.36A

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pDEST16 6675 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
104..457	trxA
585..461	attR1
694..1353	CmR
1473..1557	inactivated ccdA
1695..2000	ccdB
2041..2165	attR2

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1  AGATCTCGAT CCCGCGAAAT TAATACGACT CACTATAGGG AGACCACAAC GGTTTCCCTC
61 TAGAAATAAT TTTGTTTAAC TTAAAGAAGG AGATATACAT ATGAGCGATA AAATTATTCA
121 CCTGACTGAC GACAGTTTTG ACACGGATGT ACTCAAAGCG GACGGGGCGA TCCTCGTCGA
181 TTTCTGGGCA GAGTGGTGCG GTCCGTGCAA AATGATCGCC CCGATTCTGG ATGAAATCGC
241 TGACGAATAT CAGGGCAAAC TGACCGTTGC AAAACTGAAC ATCGATCAAA ACCCTGGCAC
301 TGCGCCGAAA TATGGCATCC GTGGTATCCC GACTCTGCTG CTGTTCAAAA ACGGTGAAGT
361 GCGGGCAACC AAAGTGGGTG CACTGTCTAA AGGTCAGTTG AAAGAGTTCC TCGACGCTAA
421 CCTGGCCGGT TCTGGTTCTG GTGATGACGA TGACAAGATC ACAAGTTTGT ACAAAAAAGC
481 TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA AATTAGATTT TGCATAAAAA
541 ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC CGCATTAGGC
601 ACCCCAGGCT TTACACTTTA TGCTTCCGGC TCGTATAATG TGTGGATTTT GAGTTAGGAT
661 CCGGCGAGAT TTTCAGGAGC TAAGGAAGCT AAAATGGAGA AAAAAATCAC TGGATATACC
721 ACCGTTGATA TATCCCAATG GCATCGTAAA GAACATTTTG AGGCATTTCA GTCAGTTGCT
781 CAATGTACCT ATAACCAGAC CGTTCAGCTG GATATTACGG CCTTTTAAA GACCGTAAAG
841 AAAAATAAGC ACAAGTTTTA TCCGGCCTTT ATTCACATTC TTGCCCGCCT GATGAATGCT
901 CATCCGGAAT TCCGTATGGC AATGAAAGAC GGTGAGCTGG TGATATGGGA TAGTGTTTAC
961 CCTTGTTACA CCGTTTTCCA TGAGCAAAC TAAACGTTTT CATCGCTCTG GAGTGAATAC
1021 CACGACGATT TCCGGCAGTT TCTACACATA TATTCGCAAG ATGTGGCGTG TTACGGTGAA
1081 AACCTGGCCT ATTTCCCTAA AGGGTTTATT GAGAATATGT TTTTCGTCTC AGCCAATCCC
1141 TGGGTGAGTT TCACCAGTTT TGATTTAAAC GTGGCCAATA TGGACAAC TTCTCGCCCC
1201 GTTTTCACCA TGGGCAAATA TTATACGCAA GCGGACAAGG TGCTGATGCC GCTGGCGATT
1261 CAGGTTTCATC ATGCCGTCTG TGATGGCTTC CATGTCGGCA GAATGCTTAA TGAATTACAA
1321 CAGTACTGCG ATGAGTGGCA GGGCGGGGCG TAAACGCGTG GATCCGGCTT ACTAAAAGCC
1381 AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGCGGTA TAAGAATATA TACTGATATG
1441 TATACCCGAA GTATGTCAAA AAGAGGTGTG CTATGAAGCA GCGTATTACA GTGACAGTTG
1501 ACAGCGACAG CTATCAGTTG CTCAAGGCAT ATATGATGTC AATATCTCCG GTCTGGTAAG
1561 CACAACCATG CAGAATGAAG CCCGTCGTCT GCGTGCCGAA CGCTGGAAAG CGGAAAATCA
1621 GGAAGGGATG GCTGAGGTCG CCCGTTTAT TGAAATGAAC GGCTCTTTTG CTGACGAGAA
1681 CAGGGACTGG TGAAATGCAG TTAAAGGTTT ACACCTATAA AAGAGAGAGC CGTTATCGTC
1741 TGTTTGTGGA TGTACAGAGT GATATTATTG ACACGCCCGG GCGACGGATG GTGATCCCCC
1801 TGGCCAGTGC ACGTCTGCTG TCAGATAAAG TCTCCCGTGA ACTTTACCCG GTGGTGCATA
1861 TCGGGGATGA AAGCTGGCGC ATGATGACCA CCGATATGGC CAGTGTGCCG GTCTCCGTTA
1921 TCGGGGAAGA AGTGGCTGAT CTCAGCCACC GCGAAAATGA CATCAAAAAC GCCATTAACC

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FIG.36B

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1981	TGATGTTCTG	GGGAATATAA	ATGTCAGGCT	CCCTTATACA	CAGCCAGTCT	GCAGGTCGAC
2041	CATAGTGACT	GGATATGTTG	TGTTTTACAG	TATTATGTAG	TCTGTTTTTT	ATGCAAAATC
2101	TAATTTAATA	TATTGATATT	TATATCATTT	TACGTTTCTC	G TTCAGCTTT	CTTGTACAAA
2161	GTGGTGATGA	TCCGGCTGCT	AACAAAGCCC	GAAAGGAAGC	TGAGTTGGCT	GCTGCCACCG
2221	CTGAGCAATA	ACTAGCATAA	CCCCTTGGGG	CCTCTAAACG	GGTCTTGAGG	GGTTTTTTGC
2281	TGAAAGGAGG	AACTATATCC	GGATATCCAC	AGGACGGGTG	TGGTCGCCAT	GATCGCGTAG
2341	TCGATAGTGG	CTCCAAGTAG	CGAAGCGAGC	AGGACTGGGC	GGCGGCCAAA	GCGGTCGGAC
2401	AGTGCTCCGA	GAACGGGTGC	GCATAGAAAT	TGCATCAACG	CATATAGCGC	TAGCAGCACG
2461	CCATAGTGAC	TGGCGATGCT	GTCGGAATGG	ACGATATCCC	GCAAGAGGCC	CGGCAGTACC
2521	GGCATAACCA	AGCCTATGCC	TACAGCATCC	AGGGTGACGG	TGCCGAGGAT	GACGATGAGC
2581	GCATTGTTAG	ATTTCATACA	CGGTGCCTGA	CTGCGTTAGC	AATTTAACTG	TGATAAACTA
2641	CCGCATTAAA	GCTTATCGAT	GATAAGCTGT	CAAACATGAG	AATTCTTGAA	GACGAAAGGG
2701	CCTCGTGATA	CGCCTATTTT	TATAGGTTAA	TGTCATGATA	ATAATGGTTT	CTTAGACGTC
2761	AGGTGGCACT	TTTCGGGGAA	ATGTGCGCGG	AACCCCTATT	TGTTTATTTT	TCTAAATACA
2821	TTCAAATATG	TATCCGCTCA	TGAGACAATA	ACCCTGATAA	ATGCTTCAAT	AATATTGAAA
2881	AAGGAAGAGT	ATGAGTATTC	AACATTTCCG	TGTCGCCCTT	ATTCCCTTTT	TTGCGGCATT
2941	TTGCCTTCCT	GTTTTTGCTC	ACCCAGAAAC	GCTGGTGAAA	GTAAAAGATG	CTGAAGATCA
3001	GTTGGGTGCA	CGAGTGGGTT	ACATCGAACT	GGATCTCAAC	AGCGGTAAAG	TCCTTGAGAG
3061	TTTTCGCCCC	GAAGAACGTT	TTCCAATGAT	GAGCACTTTT	AAAGTTCTGC	TATGTGGCGC
3121	GGTATTATCC	CGTGTTGACG	CCGGGCAAGA	GCAACTCGGT	CGCCGCATAC	ACTATTCTCA
3181	GAATGACTTG	GTTGAGTACT	CACCAGTCAC	AGAAAAGCAT	CTTACGGATG	GCATGACAGT
3241	AAGAGAATTA	TGCAGTGCTG	CCATAACCAT	GAGTGATAAC	ACTGCGGCCA	ACTTACTTCT
3301	GACAACGATC	GGAGGACCGA	AGGAGCTAAC	CGCTTTTTTG	CACAACATGG	GGGATCATGT
3361	AACTCGCCTT	GATCGTTGGG	AACCGGAGCT	GAATGAAGCC	ATACCAAACG	ACGAGCGTGA
3421	CACCACGATG	CCTGCAGCAA	TGGCAACAAC	GTTGCGCAAA	CTATTAAGTG	GCGAACTACT
3481	TACTCTAGCT	TCCCGGCAAC	AATTAATAGA	CTGGATGGAG	GCGGATAAAG	TTGCAGGACC
3541	ACTTCTGCGC	TCGGCCCTTC	CGGCTGGCTG	GTTTATTGCT	GATAAATCTG	GAGCCGGTGA
3601	GCGTGGGTCT	CGCGGTATCA	TTGCAGCACT	GGGGCCAGAT	GGTAAGCCCT	CCCGTATCGT
3661	AGTTATCTAC	ACGACGGGGA	GTCAGGCAAC	TATGGATGAA	CGAAATAGAC	AGATCGCTGA
3721	GATAGGTGCC	TCACTGATTA	AGCATTGGTA	ACTGTCAGAC	CAAGTTTACT	CATATATACT
3781	TTAGATTGAT	TTAAAAC TTC	ATTTTAAATT	TAAAAGGATC	TAGGTGAAGA	TCCTTTTTGA
3841	TAATCTCATG	ACCAAAATCC	CTTAACGTGA	GTTTTTCGTT	CACTGAGCGT	CAGACCCCGT
3901	AGAAAAGATC	AAAGGATCTT	CTTGAGATCC	TTTTTTTCTG	CGCGTAATCT	GCTGCTTGCA
3961	AACAAAAAAA	CCACCGCTAC	CAGCGGTGGT	TTGTTTGCCG	GATCAAGAGC	TACCAACTCT
4021	TTTTCCGAAG	GTAAGTGGCT	TCAGCAGAGC	GCAGATACCA	AATACTGTCC	TTCTAGTGTA
4081	GCCGTAGTTA	GGCCACCACT	TCAAGAACTC	TGTAGCACCG	CCTACATACC	TCGCTCTGCT
4141	AATCCTGTTA	CCAGTGGCTG	CTGCCAGTGG	CGATAAGTCG	TGTCTTACCG	GGTTGGACTC
4201	AAGACGATAG	TTACCGGATA	AGGCGCAGCG	GTCGGGCTGA	ACGGGGGGTT	CGTGCACACA
4261	GCCCAGCTTG	GAGCGAACGA	CCTACACCGA	ACTGAGATAC	CTACAGCGTG	AGCTATGAGA
4321	AAGCGCCACG	CTTCCCGAAG	GGAGAAAGGC	GGACAGGTAT	CCGGTAAGCG	GCAGGGTCGG
4381	AACAGGAGAG	CGCACGAGGG	AGCTTCCAGG	GGGAAACGCC	TGGTATCTTT	ATAGTCCTGT

FIG.36C

4441 CGGGTTTCGC CACCTCTGAC TTGAGCGTCG ATTTTGTGA TGCTCGTCAG GGGGGCGGAG
 4501 CCTATGGAAA AACGCCAGCA ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT
 4561 TGCTCACATG TTCTTTCCTG CGTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCCTT
 4621 TGAGTGAGCT GATACCGCTC GCCGCAGCCG AACGACCGAG CGCAGCGAGT CAGTGAGCGA
 4681 GGAAGCGGAA GAGCGCCTGA TGCGGTATTT TCTCCTTACG CATCTGTGCG GTATTTTACA
 4741 CCGCATATAT GGTGCACTCT CAGTACAATC TGCTCTGATG CCGCATAGTT AAGCCAGTAT
 4801 AACTCCGCT ATCGCTACGT GACTGGGTCA TGGCTGCGCC CCGACACCCG CCAACACCCG
 4861 CTGACGCGCC CTGACGGGCT TGTCTGCTCC CGGCATCCGC TTACAGACAA GCTGTGACCG
 4921 TCTCCGGGAG CTGCATGTGT CAGAGGTTTT CACCGTCATC ACCGAAACGC GCGAGGCAGC
 4981 TGCGGTAAAG CTCATCAGCG TGGTCGTGAA GCGATTGACA GATGTCTGCC TGTTTCATCCG
 5041 CGTCCAGCTC GTTGAGTTTC TCCAGAAGCG TTAATGTCTG GCTTCTGATA AAGCGGGCCA
 5101 TGTAAAGGGC GGTTTTTTCC TGTTTGGTCA CTGATGCCTC CGTGTAAGGG GGATTTCTGT
 5161 TCATGGGGGT AATGATACCG ATGAAACGAG AGAGGATGCT CACGATACGG GTTACTGATG
 5221 ATGAACATGC CCGGTTACTG GAACGTTGTG AGGGTAAACA ACTGGCGGTA TGGATGCGGC
 5281 GGGACCAGAG AAAAATCACT CAGGGTCAAT GCCAGCGCTT CGTTAATACA GATGTAGGTG
 5341 TTCCACAGGG TAGCCAGCAG CATCCTGCGA TGCAGATCCG GAACATAATG GTGCAGGGCG
 5401 CTGACTTCCG CGTTTCCAGA CTTTACGAAA CACGGAAACC GAAGACCATT CATGTTGTTG
 5461 CTCAGGTCGC AGACGTTTTG CAGCAGCAGT CGCTTCACGT TCGCTCGCGT ATCGGTGATT
 5521 CATTCTGCTA ACCAGTAAGG CAACCCCGCC AGCCTAGCCG GGTCCTCAAC GACAGGAGCA
 5581 CGATCATGCG CACCCGTGGC CAGGACCCAA CGCTGCCCGA GATGCGCCGC GTGCGGCTGC
 5641 TGGAGATGGC GGACGCGATG GATATGTTCT GCCAAGGGTT GGTTTGCGCA TTCACAGTTC
 5701 TCCGCAAGAA TTGATTGGCT CCAATTCTTG GAGTGGTGAA TCCGTTAGCG AGGTGCCGCC
 5761 GGCTTCCATT CAGGTCGAGG TGGCCCGGCT CCATGCACCG CGACGCAACG CGGGGAGGCA
 5821 GACAAGGTAT AGGGCGGCGC CTACAATCCA TGCCAACCCG TTCCATGTGC TCGCCGAGGC
 5881 GGCATAAATC GCCGTGACGA TCAGCGGTCC AGTGATCGAA GTTAGGCTGG TAAGAGCCGC
 5941 GAGCGATCCT TGAAGCTGTC CCTGATGGTC GTCATCTACC TGCCTGGACA GCATGGCCTG
 6001 CAACGCGGGC ATCCCGATGC CGCCGGAAGC GAGAAGAATC ATAATGGGGA AGGCCATCCA
 6061 GCCTCGCGTC GCGAACGCCA GCAAGACGTA GCCCAGCGCG TCGGCCGCCA TGCCGGCGAT
 6121 AATGGCCTGC TTCTCGCCGA AACGTTTGGT GGCGGGACCA GTGACGAAGG CTTGAGCGAG
 6181 GGCGTGCAAG ATTCCGAATA CCGCAAGCGA CAGGCCGATC ATCGTCGCGC TCCAGCGAAA
 6241 GCGGTCCTCG CCGAAAATGA CCCAGAGCGC TGCCGGCACC TGTCCTACGA GTTGATGAT
 6301 AAAGAAGACA GTCATAAGTG CGGCGACGAT AGTCATGCCC CGCGCCCACC GGAAGGAGCT
 6361 GACTGGGTG AAGGCTCTCA AGGGCATCGG TCGATCGACG CTCTCCCTTA TGCGACTCCT
 6421 GCATTAGGAA GCAGCCCAGT AGTAGGTTGA GGCCGTTGAG CACCGCCGCC GCAAGGAATG
 6481 GTGCATGCAA GGAGATGGCG CCCAACAGTC CCCCGGCCAC GGGGCCTGCC ACCATACCCA
 6541 CGCCGAAACA AGCGCTCATG AGCCCGAAGT GGCGAGCCCG ATCTTCCCA TCGGTGATGT
 6601 CGGCGATATA GCGGCCAGCA ACCGCACCTG TGGCGCCGGT GATGCCGGCC ACGATGCGTC
 6661 CGGCGTAGAG GATCG

FIG.36D

His6 Fusion in E. coli T7 Promoter

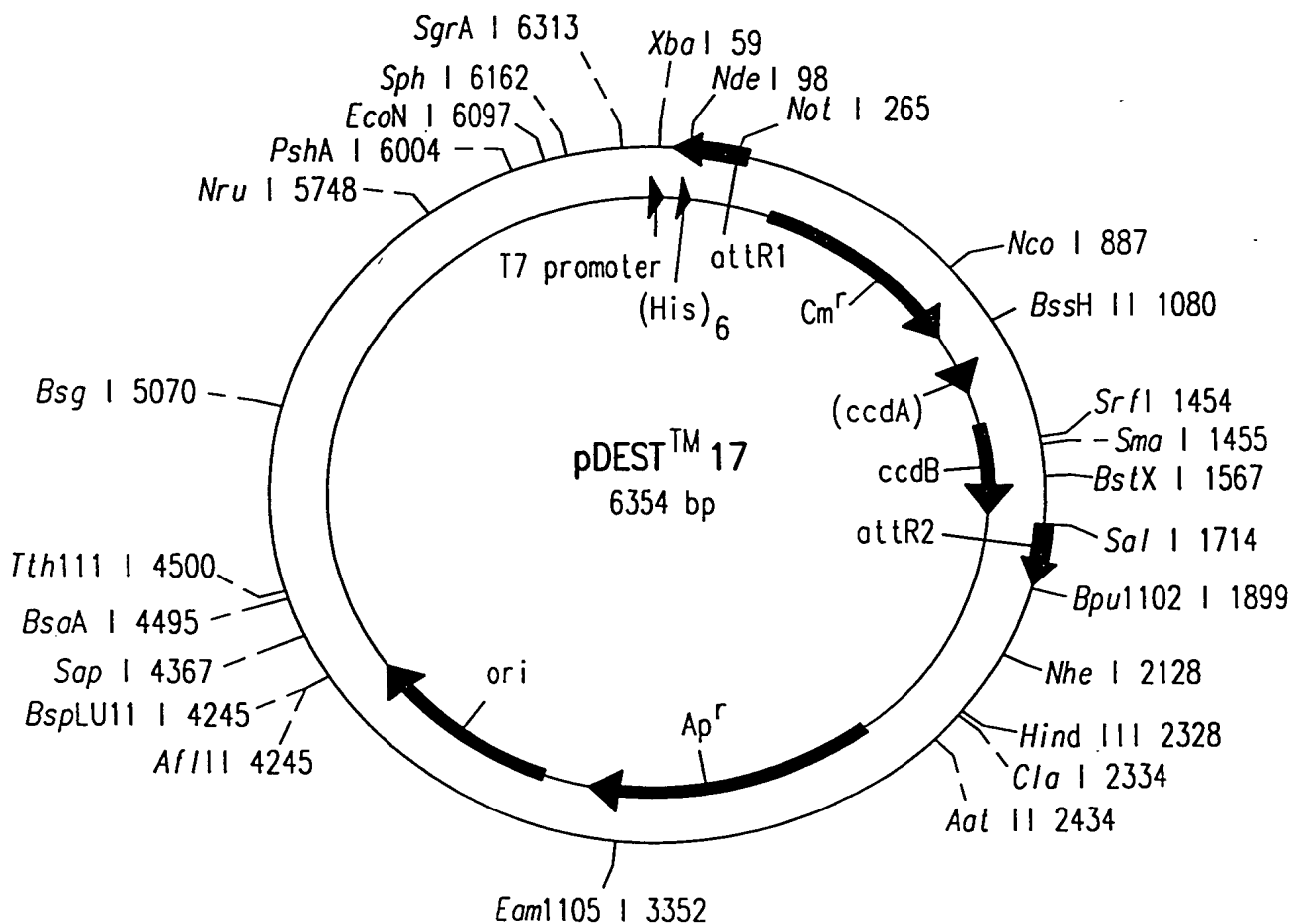
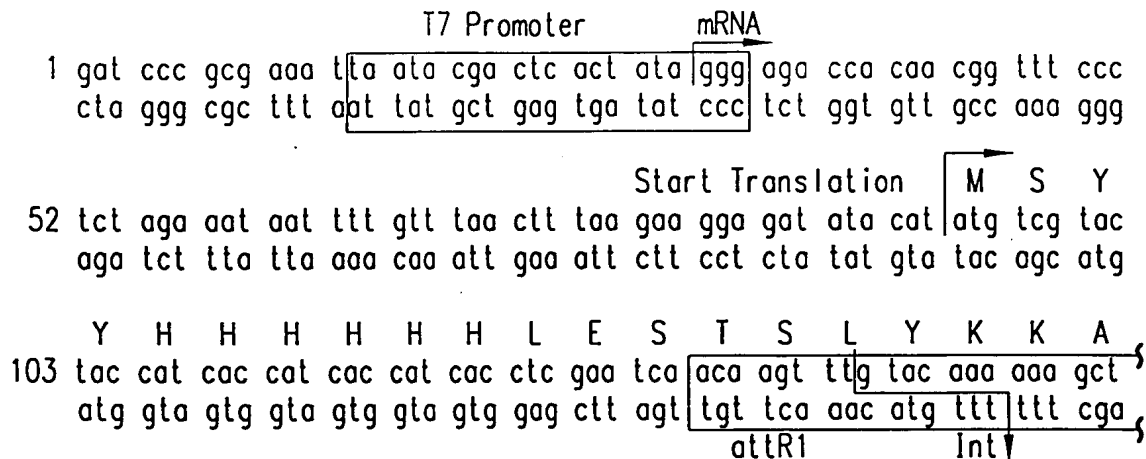


FIG.37A

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pDEST17 6354 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
258..134	attR1
367..1026	CmR
1146..1230	inactivated ccdA
1368..1673	ccdB
1714..1838	attR2
2564..3421	ampR

```

1  CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC CCTCTAGAAA
61 TAATTTTGTG TAACTTTAAG AAGGAGATAT ACATATGTG TACTACCATC ACCATCACCA
121 TCACCTCGAA TCAACAAGTT TGTACAAAAA AGCTGAACGA GAAACGTAAA ATGATATATA
181 TATCAATATA TTAAATTAGA TTTTGCATAA AAAACAGACT ACATAATACT GTAAACACA
241 ACATATCCAG TCACTATGGC GGCCGCATTA GGCACCCAG GCTTTACACT TTATGCTTCC
301 GGCTCGTATA ATGTGTGGAT TTTGAGTTAG GATCCGTCGA GATTTTCAGG AGCTAAGGAA
361 GCTAAAATGG AGAAAAAAT CACTGGATAT ACCACCGTTG ATATATCCCA ATGGCATCGT
421 AAAGAACATT TTGAGGCATT TCAGTCAGTT GCTCAATGTA CCTATAACCA GACCGTTCAG
481 CTGGATATTA CGGCCTTTTT AAAGACCGTA AAGAAAAATA AGCACAAGTT TTATCCGGCC
541 TTTATTACCA TTCTTGCCCG CCTGATGAAT GCTCATCCGG AATTCCGTAT GGCAATGAAA
601 GACGGTGAGC TGGTGATATG GGATAGTGTT CACCCTTGTT ACACCGTTTT CCATGAGCAA
661 ACTGAAACGT TTTCATCGCT CTGGAGTGAA TACCACGACG ATTTCCGGCA GTTTCTACAC
721 ATATATTCGC AAGATGTGGC GTGTTACGGT GAAAACCTGG CCTATTTCCC TAAAGGGTTT
781 ATTGAGAATA TGTTTTTCGT CTCAGCCAAT CCCTGGGTGA GTTTCACCAG TTTTGATTTA
841 AACGTGGCCA ATATGGACAA CTTCTTCGCC CCCGTTTTCA CCATGGGCAA ATATTATACG
901 CAAGGCGACA AGGTGCTGAT GCCGCTGGCG ATTCAGGTTT ATCATGCCGT CTGTGATGGC
961 TTGCATGTCG GCAGAATGCT TAATGAATTA CAACAGTACT GCGATGAGTG GCAGGGCGGG
1021 GCGTAAAGAT CTGGATCCGG CTTACTAAAA GCCAGATAAC AGTATGCGTA TTTGCGCGCT
1081 GATTTTTGCG GTATAAGAAT ATATACTGAT ATGTATACCC GAAGTATGTC AAAAAGAGGT
1141 GTGCTATGAA GCAGCGTATT ACAGTGACAG TTGACAGCGA CAGCTATCAG TTGCTCAAGG
1201 CATATATGAT GTCAATATCT CCGGTCTGGT AAGCACAACC ATGCAGAATG AAGCCCGTCG
1261 TCTGCGTGCC GAACGCTGGA AAGCGGAAAA TCAGGAAGGG ATGGCTGAGG TCGCCCGGTT
1321 TATTGAAATG AACGGCTCTT TTGCTGACGA GAACAGGGAC TGGTGAAATG CAGTTTAAGG
1381 TTTACACCTA TAAAAGAGAG AGCCGTTATC GTCTGTTTGT GGATGTACAG AGTGATATTA
1441 TTGACACGCC CGGGCGACGG ATGGTGATCC CCCTGGCCAG TGCACGTCTG CTGTCAGATA
1501 AAGTCTCCCG TGAACTTTAC CCGGTGGTGC ATATCGGGGA TGAAAGCTGG CGCATGATGA
1561 CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA AGAAGTGGCT GATCTCAGCC
1621 ACCGCGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT CTGGGGAATA TAAATGTCAG
1681 GCTCCCTTAT ACACAGCCAG TCTGCAGGTC GACCATAGTG ACTGGATATG TTGTGTTTAA

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FIG.37B

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1741	CAGTATTATG	TAGTCTGTTT	TTTATGCAAA	ATCTAATTTA	ATATATTGAT	ATTTATATCA
1801	TTTTACGTTT	CTCGTTCAGC	TTTCTTGTAC	AAAGTGGTTG	ATTCGAGGCT	GCTAACAAAG
1861	CCCGAAAGGA	AGCTGAGTTG	GCTGCTGCCA	CCGCTGAGCA	ATAACTAGCA	TAACCCCTTG
1921	GGGCCTCTAA	ACGGGTCTTG	AGGGGTTTTT	TGCTGAAAGG	AGGAACTATA	TCCGGATATC
1981	CACAGGACGG	GTGTGGTCGC	CATGATCGCG	TAGTCGATAG	TGGCTCCAAG	TAGCGAAGCG
2041	AGCAGGACTG	GGCGGCGGCC	AAAGCGGTCG	GACAGTGCTC	CGAGAACGGG	TGCGCATAGA
2101	AATTGCATCA	ACGCATATAG	CGCTAGCAGC	ACGCCATAGT	GACTGGCGAT	GCTGTGCGAA
2161	TGGACGATAT	CCCGCAAGAG	GCCCGGCAGT	ACCGGCATAA	CCAAGCCTAT	GCCTACAGCA
2221	TCCAGGGTGA	CGGTGCCGAG	GATGACGATG	AGCGCATTGT	TAGATTTCAT	ACACGGTGCC
2281	TGACTGCGTT	AGCAATTTAA	CTGTGATAAA	CTACCGCATT	AAAGCTTATC	GATGATAAGC
2341	TGTCAAACAT	GAGAATTCTT	GAAGACGAAA	GGGCCTCGTG	ATACGCCTAT	TTTTATAGGT
2401	TAATGTCATG	ATAATAATGG	TTTCTTAGAC	GTCAGGTGGC	ACTTTTCGGG	GAAATGTGCG
2461	CGGAACCCCT	ATTTGTTTAT	TTTTCTAAAT	ACATTCAAAT	ATGTATCCGC	TCATGAGACA
2521	ATAACCCTGA	TAAATGCTTC	AATAATATTG	AAAAAGGAAG	AGTATGAGTA	TTCAACATTT
2581	CCGTGTCGCC	CTTATTCCTT	TTTTTGCGGC	ATTTTGCCTT	CCTGTTTTTG	CTCACCCAGA
2641	AACGCTGGTG	AAAGTAAAAG	ATGCTGAAGA	TCAGTTGGGT	GCACGAGTGG	GTTACATCGA
2701	ACTGGATCTC	AACAGCGGTA	AGATCCTTGA	GAGTTTTTCGC	CCCGAAGAAC	GTTTTCCAAT
2761	GATGAGCACT	TTTAAAGTTC	TGCTATGTGG	CGCGGTATTA	TCCCGTGTTG	ACGCCGGGCA
2821	AGAGCAACTC	GGTCGCCGCA	TACACTATTC	TCAGAAATGAC	TTGGTTGAGT	ACTCACCAGT
2881	CACAGAAAAG	CATCTTACGG	ATGGCATGAC	AGTAAGAGAA	TTATGCAGTG	CTGCCATAAC
2941	CATGAGTGAT	AACACTGCGG	CCAACCTACT	TCTGACAACG	ATCGGAGGAC	CGAAGGAGCT
3001	AACCGCTTTT	TTGCACAACA	TGGGGGATCA	TGTAACTCGC	CTTGATCGTT	GGGAACCGGA
3061	GCTGAATGAA	GCCATACCAA	ACGACGAGCG	TGACACCACG	ATGCCTGCAG	CAATGGCAAC
3121	AACGTTGCGC	AAACTATTAA	CTGGCGAACT	ACTTACTCTA	GCTTCCCGGC	AACAATTAAT
3181	AGACTGGATG	GAGGCGGATA	AAGTTGCAGG	ACCACTTCTG	CGCTCGGCCC	TTCCGGCTGG
3241	CTGGTTTATT	GCTGATAAAT	CTGGAGCCGG	TGAGCGTGCG	TCTCGCGGTA	TCATTGCAGC
3301	ACTGGGGCCA	GATGGTAAGC	CCTCCCGTAT	CGTAGTTATC	TACACGACGG	GGAGTCAGGC
3361	AACTATGGAT	GAACGAAATA	GACAGATCGC	TGAGATAGGT	GCCTCACTGA	TTAAGCATTG
3421	GTAAGTGTCA	GACCAAGTTT	ACTCATATAT	ACTTTAGATT	GATTTAAAAC	TTCATTTTTA
3481	ATTTAAAAGG	ATCTAGGTGA	AGATCCTTTT	TGATAATCTC	ATGACCAAAA	TCCCTTAACG
3541	TGAGTTTTTCG	TTCCACTGAG	CGTCAGACCC	CGTAGAAAAG	ATCAAAGGAT	CTTCTTGAGA
3601	TCCTTTTTTTT	CTGCGCGTAA	TCTGCTGCTT	GCAAACAAAA	AAACCACCGC	TACCAGCGGT
3661	GGTTTGTGTTG	CCGGATCAAG	AGCTACCAAC	TCTTTTTCCG	AAGGTAAGT	GCTTCAGCAG
3721	AGCGCAGATA	CCAAATACTG	TCCTTCTAGT	GTAGCCGTAG	TTAGGCCACC	ACTTCAAGAA
3781	CTCTGTAGCA	CCGCCTACAT	ACCTCGCTCT	GCTAATCCTG	TTACCAGTGG	CTGCTGCCAG
3841	TGGCGATAAG	TCGTGTCTTA	CCGGGTTGGA	CTCAAGACGA	TAGTTACCGG	ATAAGGCGCA
3901	GCGGTCGGGC	TGAACGGGGG	GTTTCGTGCAC	ACAGCCCAGC	TTGGAGCGAA	CGACCTACAC
3961	CGAACTGAGA	TACCTACAGC	GTGAGCTATG	AGAAAGCGCC	ACGCTTCCCG	AAGGGAGAAA
4021	GGCGGACAGG	TATCCGGTAA	GCGGCAGGGT	CGGAACAGGA	GAGCGCACGA	GGGAGCTTCC

FIG.37C

4081 AGGGGGAAAC GCCTGGTATC TTTATAGTCC TGTCGGGTTT CGCCACCTCT GACTTGAGCG
 4141 TCGATTTTTG TGATGCTCGT CAGGGGGGCG GAGCCTATGG AAAACGCCA GCAACGCGGC
 4201 CTTTTTACGG TTCCTGGCCT TTTGCTGGCC TTTTGCTCAC ATGTTCTTTC CTGCGTTATC
 4261 CCCTGATTCT GTGGATAACC GTATTACCGC CTTTGAGTGA GCTGATACCG CTCGCCGCAG
 4321 CCGAACGACC GAGCGCAGCG AGTCAGTGAG CGAGGAAGCG GAAGAGCGCC TGATGCGGTA
 4381 TTTTCTCCTT ACGCATCTGT GCGGTATTTT ACACCGCATA TATGGTGCAC TCTCAGTACA
 4441 ATCTGCTCTG ATGCCGCATA GTTAAGCCAG TATACTACTCC GCTATCGCTA CGTGA CTGGG
 4501 TCATGGCTGC GCCCGACAC CCGCCAACAC CCGCTGACGC GCCCTGACGG GCTTGTCTGC
 4561 TCCCGGCATC CGCTTACAGA CAAGCTGTGA CCGTCTCCGG GAGCTGCATG TGTCAGAGGT
 4621 TTTCACCGTC ATCACCGAAA CGCGCGAGGC AGCTGCGGTA AAGCTCATCA GCGTGGTCGT
 4681 GAAGCGATTG ACAGATGTCT GCCTGTTTCT CCGCGTCCAG CTCGTTGAGT TTCTCCAGAA
 4741 GCGTTAATGT CTGGCTTCTG ATAAAGCGGG CCATGTTAAG GGCGGTTTTT TCCTGTTTGG
 4801 TCACTGATGC CTCCGTGTAA GGGGGATTTC TGTTTCATGGG GGTAATGATA CCGATGAAAC
 4861 GAGAGAGGAT GCTCACGATA CGGGTACTG ATGATGAACA TGCCCGGTTA CTGGAACGTT
 4921 GTGAGGGTAA ACAACTGGCG GTATGGATGC GCGGGGACCA GAGAAAAATC ACTCAGGGTC
 4981 AATGCCAGCG CTTTCGTTAAT ACAGATGTAG GTGTTCCACA GGGTAGCCAG CAGCATCCTG
 5041 CGATGCAGAT CCGGAACATA ATGGTGCAGG GCGCTGACTT CCGCGTTTCC AGACTTTACG
 5101 AAACACGGAA ACCGAAGACC ATTCATGTTG TTGCTCAGGT CGCAGACGTT TTGCAGCAGC
 5161 AGTCGCTTCA CGTTCGCTCG CGTATCGGTG ATTCATTCTG CTAACCAGTA AGGCAACCCC
 5221 GCCAGCCTAG CCGGGTCCTC AACGACAGGA GCACGATCAT GCGCACCCGT GGCCAGGACC
 5281 CAACGCTGCC CGAGATGCGC CGCGTGCGGC TGCTGGAGAT GGCGGACGCG ATGGATATGT
 5341 TCTGCCAAGG GTTGGTTTTG GCATTACAG TTCTCCGCAA GAATTGATTG GCTCCAATTC
 5401 TTGGAGTGGT GAATCCGTTA GCGAGGTGCC GCCGGCTTCC ATTCAGGTCG AGGTGGCCCG
 5461 GCTCCATGCA CCGCGACGCA ACGCGGGGAG GCAGACAAGG TATAGGGCGG CGCCTACAAT
 5521 CCATGCCAAC CCGTTCCATG TGCTCGCCGA GGCGGCATAA ATCGCCGTGA CGATCAGCGG
 5581 TCCAGTGATC GAAGTTAGGC TGGTAAGAGC CGCGAGCGAT CTTGAAGCT GTCCCTGATG
 5641 GTCGTCATCT ACCTGCCTGG ACAGCATGGC CTGCAACGCG GGCATCCCGA TGCCGCCGGA
 5701 AGCGAGAAGA ATCATAATGG GGAAGGCCAT CCAGCCTCGC GTCGCGAACG CCAGCAAGAC
 5761 GTAGCCCAGC GCGTCGGCCG CCATGCCGGC GATAATGGCC TGCTTCTCGC CGAAACGTTT
 5821 GGTGGCGGGA CCAGTGACGA AGGCTTGAGC GAGGGCGTGC AAGATTCCGA ATACCGCAAG
 5881 CGACAGGCCG ATCATCGTCG CGCTCCAGCG AAAGCGGTCC TCGCCGAAAA TGACCCAGAG
 5941 CGCTGCCGGC ACCTGTCCTA CGAGTTGCAT GATAAAGAAG ACAGTCATAA GTGCGGCGAC
 6001 GATAGTCATG CCCC GCGCCC ACCGGAAGGA GCTGACTGGG TTGAAGGCTC TCAAGGGCAT
 6061 CGGTCGATCG ACGCTCTCCC TTATGCGACT CCTGCATTAG GAAGCAGCCC AGTAGTAGGT
 6121 TGAGGCCGTT GAGCACCGCC GCCGCAAGGA ATGGTGATG CAAGGAGATG GCGCCCAACA
 6181 GTCCCCCGGC CACGGGGCCT GCCACCATAC CCACGCCGAA ACAAGCGCTC ATGAGCCCGA
 6241 AGTGGCGAGC CCGATCTTCC CCATCGGTGA TGTCGGCGAT ATAGGCGCCA GCAACCGCAC
 6301 CTGTGGCGCC GGTGATGCCG GCCACGATGC GTCCGGCGTA GAGGATCGAG ATCT

FIG.37D

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FastBac Transfer Vector with p10 Baculovirus Promoter

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1   gaagacctcg gccgctgcgg cgcttgccgg tggctgtgac cccggatgaa gtaggttcga
   cttctggagc cggcagcgcc gcgaacggcc accacgactg gggcctactt caccaagcgt

61  tccctgggtt tctggaagcg gagcatcggt tgttcgcccc ggactctagc tatagttcta
   agggaccaa agaccttcg ctcgtagcaa acaagcgggt cctgagatcg atatcaagat

121 gtaggttggt acgtatcgag caagaataa aaacgccaaa cgcgttgagg tcttggtgac
   caccaaccga tcatagctc gttcttttat ttgctgggtt gcgcaaccac agaacacagc

                                     p10 Promoter
181 tttttttaca aagattcaga aatagcctc acttacaaca agggggacta tgaattatg
   ataaaaatgt ttctaagctt ttatgcgtag tgaatgttgt tccccctgat actttaatat

241 ctttttgagg atgccgggac cttaattca acccaacaca atatatata gttaaatcag mRNA
   gtaaaactcc tacggccctg gaaattcagt tgggttgtgt tatataatat caattttatc

301 aattttttat caaatcattt gatatatta taaaatacta tactglaaat tacattttat
   ttaataaata gtttagtaaa catataatta attttatgat atgacattta atglaaata

361 ttacaatgag gatcatcaca agtttgtaca aaaaagctga acgagaacgc taaatgata
   aatgttactc ctgtatgtgt tcaaacatgt tttttcgact tgctctttgc attttactat
                                     ....Int↓ attR1

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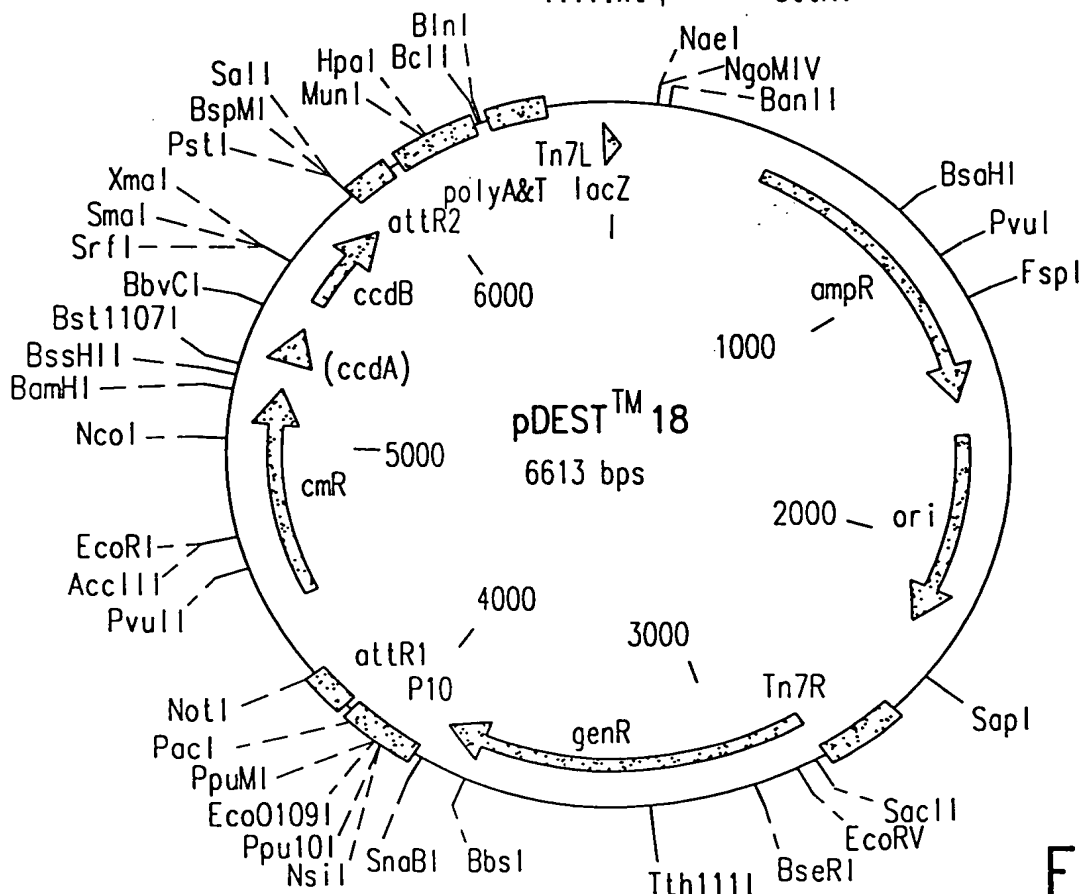


FIG.38A

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pDEST18 6613 bp

<u>Location (Base Nos.)</u>			<u>Gene Encoded</u>		
474..1449			ampR		
1590..2244			ori		
2738..3850			genR		
4251..4127			attR1		
4501..5160			CmR		
5280..5364			inactivated ccdA		
5502..5807			ccdB		
5848..5972			attR2		
6595..25			lacZ		

1	GACGCGCCCT	GTAGCGGCGC	ATTAAGCGCG	GCGGGTGTGG	TGGTTACGCG	CAGCGTGACC
61	GCTACACTTG	CCAGCGCCCT	AGCGCCCGCT	CCTTTCGCTT	TCTTCCCTTC	CTTTCTCGCC
121	ACGTTTCGCCG	GCTTTCCTCCG	TCAAGCTCTA	AATCGGGGGC	TCCCTTTAGG	GTTCCGATTT
181	AGTGCTTTAC	GGCACCTCGA	CCCCAAAAAA	CTTGATTAGG	GTGATGGTTC	ACGTAGTGGG
241	CCATCGCCCT	GATAGACGGT	TTTTCGCCCT	TTGACGTTGG	AGTCCACGTT	CTTTAATAGT
301	GGACTCTTGT	TCCAAACTGG	AACAACACTC	AACCCTATCT	CGGTCTATTC	TTTTGATTTA
361	TAAGGGATTT	TGCCGATTTT	GGCCTATTGG	TTAAAAAATG	AGCTGATTTA	ACAAAAATTT
421	AACGCGAATT	TTAACAAAAT	ATTAACGTTT	ACAATTTTCAG	GTGGCACTTT	TCGGGGAAAT
481	GTGCGCGGAA	CCCCTATTTG	TTTATTTTTT	TAAATACATT	CAAATATGTA	TCCGCTCATG
541	AGACAATAAC	CCTGATAAAT	GCTTCAATAA	TATTGAAAAA	GGAAGAGTAT	GAGTATTCAA
601	CATTTCCGTG	TCGCCCTTAT	TCCCTTTTTT	GCGGCATTTT	GCCTTCCTGT	TTTTGCTCAC
661	CCAGAAACGC	TGGTGAAAGT	AAAAGATGCT	GAAGATCAGT	TGGGTGCACG	AGTGGGTTAC
721	ATCGAACTGG	ATCTCAACAG	CGGTAAGATC	CTTGAGAGTT	TTCGCCCCGA	AGAACGTTTT
781	CCAATGATGA	GCACTTTTAA	AGTTCTGCTA	TGTGGCGCGG	TATTATCCCG	TATTGACGCC
841	GGGCAAGAGC	AACTCGGTCT	CCGCATACAC	TATTCTCAGA	ATGACTTGGT	TGAGTACTCA
901	CCAGTCACAG	AAAAGCATCT	TACGGATGGC	ATGACAGTAA	GAGAATTATG	CAGTGCTGCC
961	ATAACCATGA	GTGATAACAC	TGCGGCCAAC	TTACTTCTGA	CAACGATCGG	AGGACCGAAG
1021	GAGCTAACCG	CTTTTTTTGCA	CAACATGGGG	GATCATGTAA	CTCGCCTTGA	TCGTTGGGAA
1081	CCGGAGCTGA	ATGAAGCCAT	ACCAAACGAC	GAGCGTGACA	CCACGATGCC	TGTAGCAATG
1141	GCAACAACGT	TGCGCAAAC	ATTAACCTGG	GAACACTTTA	CTCTAGCTTC	CCGGCAACAA
1201	TTAATAGACT	GGATGGAGGC	GGATAAAGTT	GCAGGACCAC	TTCTGCGCTC	GGCCCTTCCG
1261	GCTGGCTGGT	TTATTGCTGA	TAAATCTGGA	GCCGGTGAGC	GTGGGTCTCG	CGGTATCATT
1321	GCAGCACTGG	GGCCAGATGG	TAAGCCCTCC	CGTATCGTAG	TTATCTACAC	GACGGGGAGT
1381	CAGGCAACTA	TGGATGAACG	AAATAGACAG	ATCGCTGAGA	TAGGTGCCTC	ACTGATTAAG
1441	CATTGGTAAC	TGTCAGACCA	AGTTTACTCA	TATATACTTT	AGATTGATTT	AAAACCTTCAT
1501	TTTTAATTTA	AAAGGATCTA	GGTGAAGATC	CTTTTTGATA	ATCTCATGAC	CAAAATCCCT
1561	TAACGTGAGT	TTTCGTTCCA	CTGAGCGTCA	GACCCCGTAG	AAAAGATCAA	AGGATCTTCT
1621	TGAGATCCTT	TTTTTCTGCG	CGTAATCTGC	TGCTTGCAAA	CAAAAAAACC	ACCGCTACCA
1681	GCGGTGGTTT	GTTTGCCGGA	TCAAGAGCTA	CCAACCTTTT	TTCCGAAGGT	AACTGGCTTC
1741	AGCAGAGCGC	AGATACCAAA	TACTGTCCTT	CTAGTGTAGC	CGTAGTTAGG	CCACCACTTC

FIG.38B

1801	AAGAACTCTG	TAGCACCGCC	TACATACCTC	GCTCTGCTAA	TCCTGTTACC	AGTGGCTGCT
1861	GCCAGTGGCG	ATAAGTCGTG	TCTTACCGGG	TTGGACTCAA	GACGATAGTT	ACCGGATAAG
1921	GCGCAGCGGT	CGGGCTGAAC	GGGGGGTTTCG	TGCACACAGC	CCAGCTTGGA	GCGAACGACC
1981	TACACCGAAC	TGAGATACCT	ACAGCGTGAG	CATTGAGAAA	GCGCCACGCT	TCCCGAAGGG
2041	AGAAAGGCGG	ACAGGTATCC	GGTAAGCGGC	AGGGTCGGAA	CAGGAGAGCG	CACGAGGGAG
2101	CTTCCAGGGG	GAAACGCCTG	GTATCTTTAT	AGTCCTGTCTG	GGTTTCGCCA	CCTCTGACTT
2161	GAGCGTCGAT	TTTTGTGATG	CTCGTCAGGG	GGGCGGAGCC	TATGGAAAAA	CGCCAGCAAC
2221	GCGGCCTTTT	TACGGTTCCT	GGCCTTTTGC	TGGCCTTTTG	CTCACATGTT	CTTTCCTGCG
2281	TTATCCCCTG	ATTCTGTGGA	TAACCGTATT	ACCGCCTTTG	AGTGAGCTGA	TACCGCTCGC
2341	CGCAGCCGAA	CGACCGAGCG	CAGCGAGTCA	GTGAGCGAGG	AAGCGGAAGA	GCGCCTGATG
2401	CGGTATTTTC	TCCTTACGCA	TCTGTGCGGT	ATTTACACACC	GCAGACCAGC	CGCGTAACCT
2461	GGCAAAATCG	GTTACGGTTG	AGTAATAAAT	GGATGCCCTG	CGTAAGCGGG	TGTGGGCGGA
2521	CAATAAAGTC	TTAAACTGAA	CAAAATAGAT	CTAAACTATG	ACAATAAAGT	CTTAAACTAG
2581	ACAGAATAGT	TGTAAACTGA	AATCAGTCCA	GTTATGCTGT	GA AAAAGCAT	ACTGGACTTT
2641	TGTTATGGCT	AAAGCAAAC	CTTCATTTTC	TGAAGTGCAA	ATTGCCCGTC	GTATTAAAGA
2701	GGGGCGTGGC	CAAGGGCATG	GTAAAGACTA	TATTCGCGGC	GTTGTGACAA	TTTACCGAAC
2761	AACTCCGCGG	CCGGGAAGCC	GATCTCGGCT	TGAACGAATT	GTTAGGTGGC	GGTACTTGGG
2821	TCGATATCAA	AGTGCATCAC	TTCTTCCCGT	ATGCCCAACT	TTGTATAGAG	AGCCACTGCG
2881	GGATCGTCAC	CGTAATCTGC	TTGCACGTAG	ATCACATAAG	CACCAAGCGC	GTTGGCCTCA
2941	TGCTTGAGGA	GATTGATGAG	CGCGGTGGCA	ATGCCCTGCC	TCCGGTGCTC	GCCGGAGACT
3001	GCGAGATCAT	AGATATAGAT	CTCACTACGC	GGCTGCTCAA	ACCTGGGCAG	AACGTAAGCC
3061	GCGAGAGCGC	CAACAACCGC	TTCTTGGTCTG	AAGGCAGCAA	GCGCGATGAA	TGTCTTACTA
3121	CGGAGCAAGT	TCCCGAGGTA	ATCGGAGTCC	GGCTGATGTT	GGGAGTAGGT	GGCTACGTCT
3181	CCGAACCTAC	GACCGAAAAG	ATCAAGAGCA	GCCCGCATGG	ATTTGACTTG	GTCAGGGCCG
3241	AGCCTACATG	TGCGAATGAT	GCCCATACTT	GAGCCACCTA	ACTTTGTTTT	AGGGCGACTG
3301	CCCTGCTGCG	TAACATCGTT	GCTGCTGCGT	AACATCGTTG	CTGCTCCATA	ACATCAAACA
3361	TCGACCCACG	GCGTAACGCG	CTTGCTGCTT	GGATGCCCGA	GGCATAGACT	GTACAAAAAA
3421	ACAGTCATAA	CAAGCCATGA	AAACCGCCAC	TGCGCCGTTA	CCACCGCTGC	GTTCCGGTCAA
3481	GGTTCTGGAC	CAGTTGCGTG	AGCGCATACG	CTACTTGCA	TACAGTTTAC	GAACCGAACA
3541	GGCTTATGTC	AACTGGGTTT	GTGCCTTCAT	CCGTTTCCAC	GGTGTGCGTC	ACCCGGCAAC
3601	CTTGGGCAGC	AGCGAAGTCG	AGGCATTTCT	GTCCTGGCTG	GCGAACGAGC	GCAAGGTTTC
3661	GGTCTCCACG	CATCGTCAGG	CATTGGCGGC	CTTGCTGTTT	TTCTACGGCA	AGGTGCTGTG
3721	CACGGATCTG	CCCTGGCTTC	AGGAGATCGG	AAGACCTCGG	CCGTCGCGGC	GCTTGCCGGT
3781	GGTGCTGACC	CCGGATGAAG	TGGTTCGCAT	CCTCGGTTTT	CTGGAAGGCG	AGCATCGTTT
3841	GTTGCGCCAG	GACTCTAGCT	ATAGTTCTAG	TGGTTGGCTA	CGTATCGAGC	AAGAAAATAA
3901	AACGCCAAAC	GCGTTGGAGT	CTTGTGTGCT	ATTTTTACAA	AGATTGAGAA	ATACGCATCA
3961	CTTACAACAA	GGGGGACTAT	GAAATTATGC	ATTTTGAGGA	TGCCGGGACC	TTTAATTCAA
4021	CCCAACACAA	TATATTATAG	TTAAATAAGA	ATTATTTATC	AAATCATTTG	TATATTAATT
4081	AAAATACTAT	ACTGTAAATT	ACATTTTATT	TACAATGAGG	ATCATCACAA	GTTTGTACAA
4141	AAAAGCTGAA	CGAGAAACGT	AAAATGATAT	AAATATCAAT	ATATTAAATT	AGATTTTGCA
4201	TAAAAAACAG	ACTACATAAT	ACTGTAAAAC	ACAACATATC	CAGTCACTAT	GGCGGCCGCT
4261	AAGTTGGCAG	CATCACCCGA	CGCACTTTGC	GCCGAATAAA	TACCTGTGAC	GGAAGATCAC
4321	TTCGCAGAAT	AAATAAATCC	TGGTGTCCCT	GTTGATACCG	GGAAGCCCTG	GGCCAACTTT

FIG.38C

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4381 TGGCGAAAAAT GAGACGTTGA TCGGCACGTA AGAGGTTCCA ACTTTCACCA TAATGAAATA
4441 AGATCACTAC CGGGCGTATT TTTTGAGTTA TCGAGATTTT CAGGAGCTAA GGAAGCTAAA
4501 ATGGAGAAAAA AAATCACTGG ATATACCACC GTTGATATAT CCCAATGGCA TCGTAAAGAA
4561 CATTTTGAGG CATTTTCAGTC AGTTGCTCAA TGTACCTATA ACCAGACCGT TCAGCTGGAT
4621 ATTACGGCCT TTTTAAAGAC CGTAAAGAAA AATAAGCACA AGTTTTATCC GGCCTTTATT
4681 CACATTCTTG CCCGCCTGAT GAATGCTCAT CCGGAATTCC GTATGGCAAT GAAAGACGGT
4741 GAGCTGGTGA TATGGGATAG TGTTACCCTT TGTTACACCG TTTTCCATGA GCAAACCTGAA
4801 ACGTTTTTCAT CGCTCTGGAG TGAATACCAC GACGATTTCC GGCAGTTTCT ACACATATAT
4861 TCGCAAGATG TGGCGTGTTA CGGTGAAAAC CTGGCCTATT TCCCTAAAGG GTTTATTGAG
4921 AATATGTTTT TCGTCTCAGC CAATCCCTGG GTGAGTTTCA CCAGTTTTGA TTTAAACGTG
4981 GCCAATATGG ACAACTTCTT CGCCCCCGTT TTCACCATGG GCAAATATTA TACGCAAGGC
5041 GACAAGGTGC TGATGCCGCT GGCGATTGAG GTTCATCATG CCGTCTGTGA TGGCTTCCAT
5101 GTCGGCAGAA TGCTTAATGA ATTACAACAG TACTGCGATG AGTGGCAGGG CGGGGCGTAA
5161 ACGCGTGGAT CCGGCTTACT AAAAGCCAGA TAACAGTATG CGTATTTGCG CGCTGATTTT
5221 TGCGGTATAA GAATATATAC TGATATGTAT ACCCGAAGTA TGTCAAAAAG AGGTGTGCTA
5281 TGAAGCAGCG TATTACAGTG ACAGTTGACA GCGACAGCTA TCAGTTGCTC AAGGCATATA
5341 TGATGTCAAT ATCTCCGGTC TGGTAAGCAC AACCATGCAG AATGAAGCCC GTCGTCTGCG
5401 TGCCGAACGC TGGAAAGCGG AAAATCAGGA AGGGATGGCT GAGGTCGCCC GGTTTATTGA
5461 AATGAACGGC TCTTTTGCTG ACGAGAACAG GGACTGGTGA AATGCAGTTT AAGGTTTACA
5521 CCTATAAAAG AGAGAGCCGT TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA
5581 CGCCCGGGCG ACGGATGGTG ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT
5641 CCCGTGAAC TTAACCGGTG GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG
5701 ATATGGCCAG TGTGCCGGTC TCCGTTATCG GGGGAAGAAGT GGCTGATCTC AGCCACCGCG
5761 AAAATGACAT CAAAAACGCC ATTAACCTGA TGTCTGGGG AATATAAATG TCAGGCTCCC
5821 TTATACACAG CCAGTCTGCA GGTGACCAT AGTGACTGGA TATGTTGTGT TTTACAGTAT
5881 TATGTAGTCT GTTTTTTATG CAAAATCTAA TTTAATATAT TGATATTTAT ATCATTTTAC
5941 GTTTCTCGTT CAGCTTTCTT GTACAAAGTG GTGATAGCTT GTCGAGAAGT ACTAGAGGAT
6001 CATAATCAGC CATAACCAT TTGTAGAGGT TTTACTTGCT TAAAAAACC TCCCACACCT
6061 CCCCTGAAC CTGAAACATA AAATGAATGC AATTGTTGTT GTTAACTTGT TTATTGCAGC
6121 TTATAATGGT TACAAATAAA GCAATAGCAT CACAAATTC ACAAATAAAG CATTTTTTTC
6181 ACTGCATTCT AGTTGTGGTT TGTCCAAACT CATCAATGTA TCTTATCATG TCTGGATCTG
6241 ATCACTGCTT GAGCCTAGGA GATCCGAACC AGATAAGTGA AATCTAGTTC CAAACTATTT
6301 TGTCATTTTT AATTTTCGTA TTAGCTTACG ACGCTACACC CAGTTCCCAT CTATTTTGTC
6361 ACTCTTCCCT AAATAATCCT TAAAACTCC ATTTCCACCC CTCCCAGTTC CCAACTATTT
6421 TGTCCGCCCA CAGCGGGGCA TTTTCTTCC TGTTATGTTT TTAATCAAAC ATCCTGCCAA
6481 CTCCATGTGA CAAACCGTCA TCTTCGGCTA CTTTTTCTCT GTCACAGAAT GAAAATTTTT
6541 CTGTCATCTC TTCGTTATTA ATGTTTGTA TGGACTGAAT ATCAACGCTT ATTTGCAGCC
6601 TGAATGGCGA ATG

FIG.38D

FastBac Transfer Vector with 39K Baculovirus Promoter

1 ggtgacgccg tcatctttcc attgtaacgt aatgggcac ttgtagatga acgcgctgtc
ccactgcggc agtagaaggg taacattgca ttaccgttg aacatctact tgcgcgacag

61 aaaaaaacgg ccagtttctt ccacaaactc ggcacaggct gtctcgtaaa cttttgcgtc
ttttttggcc ggtcaagaa ggtgtttgag cgcgtgccga cagagcattt gaaaacgcag

39K Promoter

121 gcaacaatcg cgatgacctc gtggatatgga aatTTTTTct aaaaaagtgt cgttcatgtc
cgttgtttgc gctactggag caccatocct ttaaaaaaga ttttttcaca gcaagttacag

181 ggcggcggcg ttcgcgctcc ggtacgcgcg acgggcacac agcaggacag ccttgtccgg
ccgccgccgc aagcgcgagg ccatgcgcgc tgcccggtgt tgcgtcctgtc ggaacagggc

241 ctcgattatc ataacaatc ctgcaggcat gcaagctgga tcatcacaag tttgtacaaa
gagctaatag tttttgtag gacgtccgta cgttcgacct agtagtggtc aaacatgttt

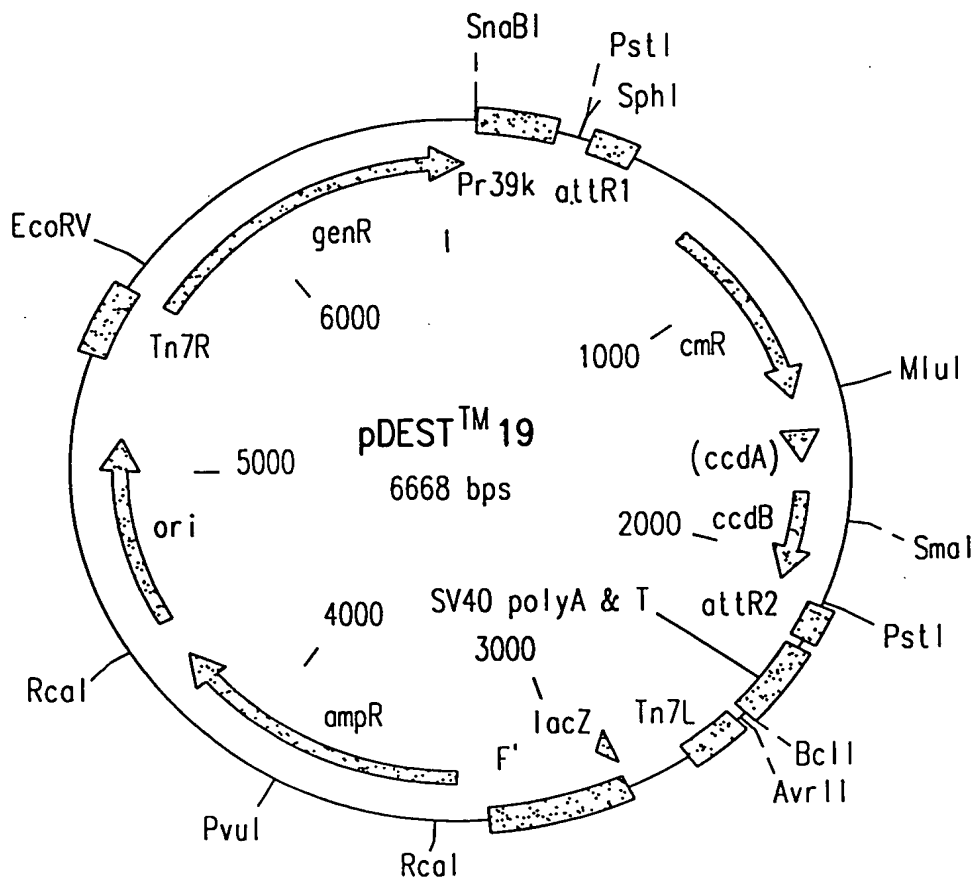


FIG.39A

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pDEST19 6668 bp (rotated to position 1000)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
515..391	attR1
765..1424	CmR
1544..1628	inactivated ccdA
1766..2071	ccdB
2112..2236	attR2
2852..2895	lacZ
3344..4319	ampR
4460..5114	ori
5608..52	genR

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1 AGTGGTTCGC ATCCTCGGTT TTCTGGAAGG CGAGCATCGT TTGTTCGCCC AGGACTCTAG
61 CTATAGTTCT AGTGGTTGGC TACGTATATC AAATACTTGT AGGTGACGCC GTCATCTTTC
121 CATTGTAACG TAAATGGCAA CTTGTAGATG AACGCGCTGT CAAAAAACCG GCCAGTTTCT
181 TCCACAAACT CGCGCACGGC TGTCTCGTAA ACTTTTGCGT CGCAACAATC GCGATGACCT
241 CGTGGTATGG AAATTTTTTC TAAAAAAGTG TCGTTCATGT CGGCGGCGGG CGCGTTCGCG
301 CTCCGGTACG CGCGACGGGC ACACAGCAGG ACAGCCTTGT CCGGCTCGAT TATCATAAAC
361 AATCCTGCAG GCATGCAAGC TCGGATCATC ACAAGTTTGT ACAAAAAAGC TGAACGAGAA
421 ACGTAAAATG ATATAAATAT CAATATATTA AATTAGATTT TGCATAAAAA ACAGACTACA
481 TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC CGCTAAGTTG GCAGCATCAC
541 CCGACGCACT TTGCGCCGAA TAAATACCTG TGACGGAAGA TCACTTCGCA GAATAAATAA
601 ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC CCTGGGCCAA CTTTTGGCGA AAATGAGACG
661 TTGATCGGCA CGTAAGAGGT TCCAACTTTC ACCATAATGA AATAAGATCA CTACCGGGCG
721 TATTTTTTGA GTTATCGAGA TTTTCAGGAG CTAAGGAAGC TAAAATGGAG AAAAAAATCA
781 CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA AGAACATTTT GAGGCATTTT
841 AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT GGATATTACG GCCTTTTTAA
901 AGACCGTAAA GAAAAATAAG CACAAGTTTT ATCCGGCCTT TATTCACATT CTTGCCCGCC
961 TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA CGGTGAGCTG GTGATATGGG
1021 ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC ATGAGCAAAC TGAAACGTTT TCATCGCTCT
1081 GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT ATATTCGCAA GATGTGGCGT
1141 GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT TGAGAATATG TTTTTCGTCT
1201 CAGCCAATCC CTGGGTGAGT TTCACCAAGT TTGATTTAAA CGTGGCCAAT ATGGACAAC
1261 TCTTCGCCCC CGTTTTACAC ATGGGCAAAT ATTATACGCA AGGCGACAAG GTGCTGATGC
1321 CGCTGGCGAT TCAGGTTTCA CATGCCGTCT GTGATGGCTT CCATGTCGGC AGAATGCTTA
1381 ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC GTAAACGCGT GGATCCGGCT
1441 TACTAAAAGC CAGATAACAG TATGCGTATT TGC GCGCTGA TTTTTCGGT ATAAGAATAT
1501 ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT GCTATGAAGC AGCGTATTAC
1561 AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA TATATGATGT CAATATCTCC
1621 GGTCTGGTAA GCACAACCAT GCAGAATGAA GCCGTCGTC TCGTGCCGA ACGCTGGA
1681 GCGGAAAATC AGGAAGGGAT GGCTGAGGTC GCCCGGTTTA TTGAAATGAA CGGCTCTTTT
1741 GCTGACGAGA ACAGGGACTG GTGAAATGCA GTTTAAGGTT TACACCTATA AAAGAGAGAG
1801 CCGTTATCGT CTGTTTGTGG ATGTACAGAG TGATATTATT GACACGCCCC GCGACGGAT
1861 GGTGATCCCC CTGGCCAGTG CACGTCTGCT GTCAGATAAA GTCTCCCGTG AACTTTACCC

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FIG.39B

1921	GGTGGTGCAT	ATCGGGGATG	AAAGCTGGCG	CATGATGACC	ACCGATATGG	CCAGTGTGCC
1981	GGTCTCCGTT	ATCGGGGAAG	AAGTGGCTGA	TCTCAGCCAC	CGCGAAAATG	ACATCAAAAA
2041	CGCCATTAAC	CTGATGTTCT	GGGGAATATA	AATGTCAGGC	TCCCTTATAC	ACAGCCAGTC
2101	TGCAGGTGCG	CCATAGTGAC	TGGATATGTT	GTGTTTTACA	GTATTATGTA	GTCTGTTTTT
2161	TATGCAAAAT	CTAATTTAAT	ATATTGATAT	TTATATCATT	TTACGTTTCT	CGTTCAGCTT
2221	TCTTGTACAA	AGTGGTGATC	GAGAAGTACT	AGAGGATCAT	AATCAGCCAT	ACCACATTTG
2281	TAGAGGTTTT	ACTTGCTTTA	AAAAACCTCC	CACACCTCCC	CCTGAACCTG	AAACATAAAA
2341	TGAATGCAAT	TGTTGTTGTT	AAC TTGTTTA	TTGCAGCTTA	TAATGGTTAC	AAATAAAGCA
2401	ATAGCATCAC	AAATTTTACA	AATAAAGCAT	TTTTTTCACT	GCATTCTAGT	TGTGGTTTTGT
2461	CCAAACTCAT	CAATGTATCT	TATCATGTCT	GGATCTGATC	ACTGCTTGAG	CCTAGGAGAT
2521	CCGAACCAGA	TAAGTGAAAT	CTAGTTCCAA	ACTATTTTGT	CATTTTTAAT	TTTCGTATTA
2581	GCTTACGACG	CTACACCCAG	TTCCCATCTA	TTTTGTCACT	CTTCCCTAAA	TAATCCTTAA
2641	AAACTCCATT	TCCACCCCTC	CCAGTTCCCA	ACTATTTTGT	CCGCCACAG	CGGGGCATTT
2701	TTCTTCCTGT	TATGTTTTTA	ATCAAACATC	CTGCCAACTC	CATGTGACAA	ACCGTCATCT
2761	TCGGCTACTT	TTTCTCTGTC	ACAGAATGAA	AATTTTTCTG	TCATCTCTTC	GTTATTAATG
2821	TTTGTAATTG	ACTGAATATC	AACGCTTATT	TGCAGCCTGA	ATGGCGAATG	GACGCGCCCT
2881	GTAGCGGCGC	ATTAAGCGCG	GCGGGTGTGG	TGGTTACGCG	CAGCGTGACC	GCTACACTTG
2941	CCAGCGCCCT	AGCGCCCGCT	CCTTTCGCTT	TCTTCCCTTC	CTTCTCGCC	ACGTTCCGCC
3001	GCTTTCCCGG	TCAAGCTCTA	AATCGGGGGC	TCCCTTTAGG	GTTCCGATTT	AGTGCTTTAC
3061	GGCACCTCGA	CCCCAAAAAA	CTTGATTAGG	GTGATGGTTC	ACGTAGTGGG	CCATCGCCCT
3121	GATAGACGGT	TTTTCGCCCT	TTGACGTTGG	AGTCCACGTT	CTTTAATAGT	GGACTCTTGT
3181	TCCAAACTGG	AACAACACTC	AACCCTATCT	CGGTCTATTC	TTTTGATTTA	TAAGGGATTT
3241	TGCCGATTTT	GGCCTATTGG	TTAAAAAATG	AGCTGATTTA	ACAAAAATTT	AACGCGAATT
3301	TTAACAAAAT	ATTAACGTTT	ACAATTTTCA	GTGGCACTTT	TCGGGGAAAT	GTGCGCGGAA
3361	CCCCTATTTG	TTTATTTTTT	TAAATACATT	CAAATATGTA	TCCGCTCATG	AGACAATAAC
3421	CCTGATAAAT	GCTTCAATAA	TATTGAAAAA	GGAAGAGTAT	GAGTATTCAA	CATTTCCGTG
3481	TCGCCCTTAT	TCCCTTTTTT	GCGGCATTTT	GCCTTCCTGT	TTTTGCTCAC	CCAGAAACGC
3541	TGGTGAAAGT	AAAAGATGCT	GAAGATCAGT	TGGGTGCACG	AGTGGGTAC	ATCGAACTGG
3601	ATCTCAACAG	CGGTAAGATC	CTTGAGAGTT	TTCGCCCCGA	AGAACGTTTT	CCAATGATGA
3661	GCACTTTTAA	AGTTCTGCTA	TGTGGCGCGG	TATTATCCCG	TATTGACGCC	GGGCAAGAGC
3721	AACTCGGTGCG	CCGCATACAC	TATTCTCAGA	ATGACTTGGT	TGAGTACTCA	CCAGTCACAG
3781	AAAAGCATCT	TACGGATGGC	ATGACAGTAA	GAGAATTATG	CAGTGCTGCC	ATAACCATGA
3841	GTGATAACAC	TGCGGCCAAC	TTACTTCTGA	CAACGATCGG	AGGACCGAAG	GAGCTAACCG
3901	CTTTTTTGCA	CAACATGGGG	GATCATGTAA	CTCGCCTTGA	TCGTTGGGAA	CCGGAGCTGA
3961	ATGAAGCCAT	ACCAAACGAC	GAGCGTGACA	CCACGATGCC	TGTAGCAATG	GCAACAACGT
4021	TGCGCAAAC	ATTAACGGC	GAACACTTAA	CTCTAGCTTC	CCGGCAACAA	TTAATAGACT
4081	GGATGGAGGC	GGATAAAGTT	GCAGGACCAC	TTCTGCGCTC	GGCCCTTCCG	GCTGGCTGGT
4141	TTATTGCTGA	TAAATCTGGA	GCCGGTGAGC	GTGGGTCTCG	CGGTATCATT	GCAGCACTGG
4201	GGCCAGATGG	TAAGCCCTCC	CGTATCGTAG	TTATCTACAC	GACGGGGAGT	CAGGCAACTA
4261	TGGATGAACG	AAATAGACAG	ATCGCTGAGA	TAGGTGCCTC	ACTGATTAAG	CATTGGTAAC
4321	TGTCAGACCA	AGTTTACTCA	TATATACTTT	AGATTGATTT	AAAACCTTCAT	TTTTAATTTA
4381	AAAGGATCTA	GGTGAAGATC	CTTTTTGATA	ATCTCATGAC	CAAATCCCT	TAACGTGAGT
4441	TTTCGTTCCA	CTGAGCGTCA	GACCCCGTAG	AAAAGATCAA	AGGATCTTCT	TGAGATCCTT

FIG.39C

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4501 TTTTCTGCG CGTAATCTGC TGCTTGCAAA CAAAAAACC ACCGCTACCA GCGGTGGTTT
4561 GTTTGCCGGA TCAAGAGCTA CCAACTCTTT TTCCGAAGGT AACTGGCTTC AGCAGAGCGC
4621 AGATACCAAA TACTGTCCTT CTAGTGTAGC CGTAGTTAGG CCACCACTTC AAGAACTCTG
4681 TAGCACCGCC TACATACCTC GCTCTGCTAA TCCTGTTACC AGTGGCTGCT GCCAGTGGCG
4741 ATAAGTCGTG TCTTACCGGG TTGGACTCAA GACGATAGTT ACCGGATAAG GCGCAGCGGT
4801 CGGGCTGAAC GGGGGGTTTCG TGCACACAGC CCAGCTTGGA GCGAACGACC TACACCGAAC
4861 TGAGATACCT ACAGCGTGAG CATTGAGAAA GCGCCACGCT TCCCGAAGGG AGAAAGGCGG
4921 ACAGGTATCC GGTAAGCGGC AGGGTCGGAA CAGGAGAGCG CACGAGGGAG CTTCCAGGGG
4981 GAAACGCCTG GTATCTTTAT AGTCCTGTCG GGTTTCGCCA CCTCTGACTT GAGCGTCGAT
5041 TTTTGTGATG CTCGTCAGGG GGGCGGAGCC TATGGAAAAA CGCCAGCAAC GCGGCCTTTT
5101 TACGGTTCCT GGCCTTTTGC TGGCCTTTTG CTCACATGTT CTTTCCTGCG TTATCCCCTG
5161 ATTCTGTGGA TAACCGTATT ACCGCCTTTG AGTGAGCTGA TACCGCTCGC CGCAGCCGAA
5221 CGACCGAGCG CAGCGAGTCA GTGAGCGAGG AAGCGGAAGA GCGCCTGATG CGGTATTTTC
5281 TCCTTACGCA TCTGTGCGGT ATTTACACCC GCAGACCAGC CGCGTAACCT GGCAAAATCG
5341 GTTACGGTTG AGTAATAAAT GGATGCCCTG CGTAAGCGGG TGTGGGCGGA CAATAAAGTC
5401 TTAAACTGAA CAAAATAGAT CTAAACTATG ACAATAAAGT CTTAAACTAG ACAGAATAGT
5461 TGTAAACTGA AATCAGTCCA GTTATGCTGT GAAAAAGCAT ACTGGACTTT TGTTATGGCT
5521 AAAGCAAACCT CTTCATTTTT TGAAGTGCAA ATTGCCCGTC GTATTAAAGA GGGGCGTGGC
5581 CAAGGGCATG GTAAAGACTA TATTCGCGGC GTTGTGACAA TTTACCGAAC AACTCCGCGG
5641 CCGGGAAGCC GATCTCGGCT TGAACGAATT GTTAGGTGGC GGTACTTGGG TCGATATCAA
5701 AGTGCATCAC TTCTTCCCGT ATGCCCAACT TTGTATAGAG AGCCACTGCG GGATCGTCAC
5761 CGTAATCTGC TTGCACGTAG ATCACATAAG CACCAAGCGC GTTGGCCTCA TGCTTGAGGA
5821 GATTGATGAG CGCGGTGGCA ATGCCCTGCC TCCGGTGCTC GCCGGAGACT GCGAGATCAT
5881 AGATATAGAT CTCACTACGC GGCTGCTCAA ACCTGGGCAG AACGTAAGCC GCGAGAGCGC
5941 CAACAACCGC TTCTTGGTCG AAGGCAGCAA GCGCGATGAA TGTCTTACTA CGGAGCAAGT
6001 TCCCGAGGTA ATCGGAGTCC GGCTGATGTT GGGAGTAGGT GGCTACGTCT CCGAACTCAC
6061 GACCGAAAAG ATCAAGAGCA GCCCGCATGG ATTTGACTTG GTCAGGGCCG AGCCTACATG
6121 TGCGAATGAT GCCCATACTT GAGCCACCTA ACTTTGTTTT AGGGCGACTG CCCTGCTGCG
6181 TAACATCGTT GCTGCTGCGT AACATCGTTG CTGCTCCATA ACATCAAACA TCGACCCACG
6241 GCGTAACGCG CTTGCTGCTT GGATGCCCGA GGCATAGACT GTACAAAAAA ACAGTCATAA
6301 CAAGCCATGA AAACCGCCAC TGCGCCGTTA CCACCGCTGC GTTCGGTCAA GGTTCTGGAC
6361 CAGTTGCGTG AGCGCATACG CTAATTGCAT TACAGTTTAC GAACCGAACA GGCTTATGTC
6421 AACTGGGTTC GTGCC TTCAT CCGTTTCCAC GGTGTGCGTC ACCCGGCAAC CTTGGGCAGC
6481 AGCGAAGTCG AGGCATTTCT GTCCTGGCTG GCGAACGAGC GCAAGGTTTC GGTCTCCACG
6541 CATCGTCAGG CATTGGCGGC CTTGCTGTTC TTCTACGGCA AGGTGCTGTG CACGGATCTG
6601 CCCTGGCTTC AGGAGATCGG AAGACCTCGG CCGTCGCGGC GCTTGCCGGT GGTGCTGACC
6661 CCGGATGA
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FIG.39D

GLUTATHIONE-S-TRANSFERASE FUSION WITH POLYHEDRON 115/253 PROMOTER FOR BACULOVIRUS EXPRESSION

polh PROMOTER

430 ggc tac gta tac tcc gga ata tta ata gat cat gga gat aat taa aat gat
ccg atg cat atg agg cct tat aat tat ata gta cct cta tta att tta cta

481 aac cat ctc gca aat aaa taa gta ttt tac tgt ttt cgt aac agt ttt gta
ttg gta gag cgt tta ttt att cat aaa atg aca aaa gca ttg tca aaa cat

532 ata aaa aaa cct ata aat att ccg gat tat tca tac cgt ccc acc atc ggg
tat ttt ttt gga tat tta taa ggc cta ata agt atg gca ggg tgg tag ccc

START TRANSLN. M A P I - - - GST - -

583 cgc gga tcc atg gcc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg
gcg cct agg tac cgg gga tat gat cca ata acc ttt taa ttc ccg gaa cac

S D L V P R H N Q T S L Y K K A

1246 tcg gat ctg gtt ccg cgt cat aat caa aca agt ttg tac aaa aaa gct gaa
agc cta gac caa ggc gca gta tta gtt tgt tca aac atg ttt ttt cga ctt

Int

1297 cga gaa acg taa aat gat ata aat atc aat ata tta aat tag at
gct ctt tgc att tta cta tat tta tag tta tat aat tta atc ta

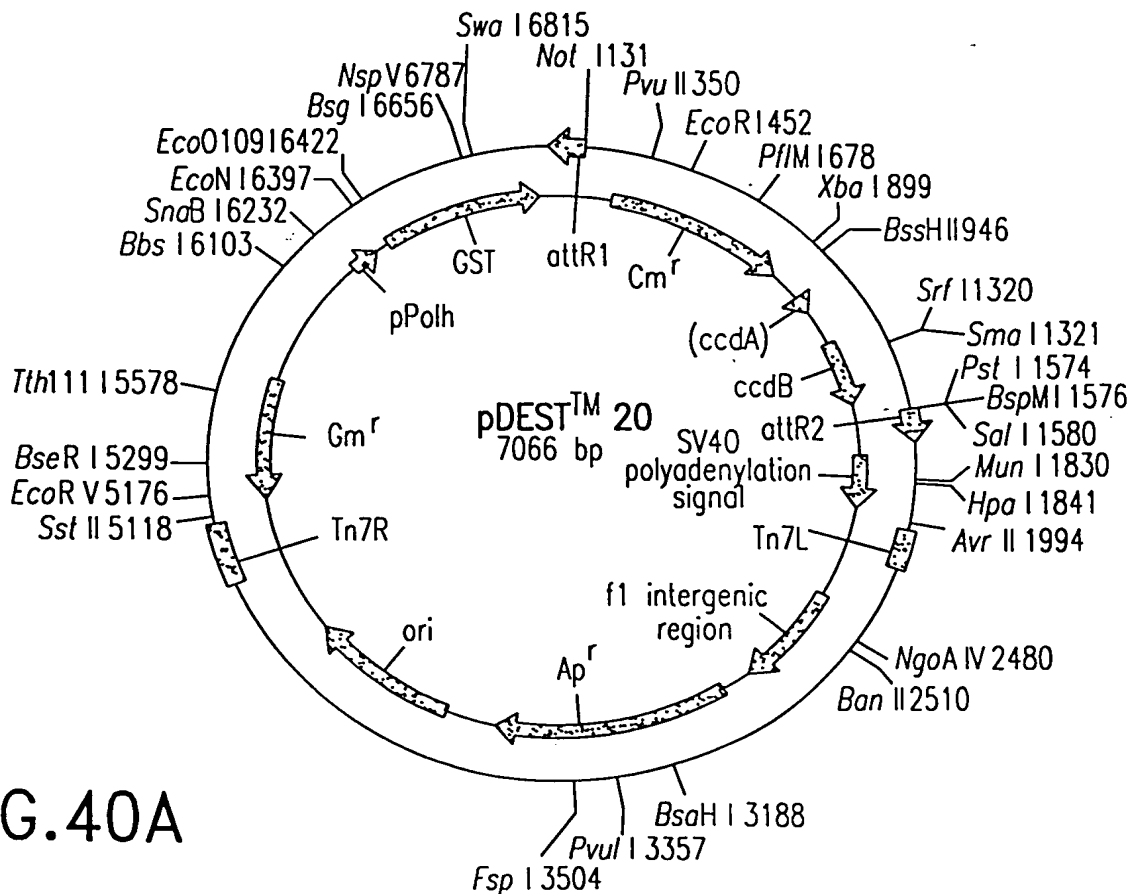


FIG.40A

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pDEST20 7066 bp (rotated to position 5800)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
592..1263	GST
1397..1273	attR1
1506..2165	CmR
2285..2369	inactivated ccdA
2507..2812	ccdB
2853..2977	attR2
4214..5064	ampR
5263..5843	ori

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1  CCACTGCGCC GTTACCACCG CTGCGTTCGG TCAAGGTTCT GGACCAGTTG CGTGAGCGCA
61 TACGCTACTT GCATTACAGT TTACGAACCG AACAGGCTTA TGTCAACTGG GTTCGTGCCT
121 TCATCCGTTT CCACGGTGTG CGTCACCCGG CAACCTTGGG CAGCAGCGAA GTCGAGGCAT
181 TTCTGTCCTG GCTGGCGAAC GAGCGCAAGG TTTCGGTCTC CACGCATCGT CAGGCATTGG
241 CGGCCTTGCT GTTCTTCTAC GGCAAGGTGC TGTGCACGGA TCTGCCCTGG CTTCAGGAGA
301 TCGGAAGACC TCGGCCGTCG CGGCGCTTGC CGGTGGTGCT GACCCCGGAT GAAGTGGTTC
361 GCATCCTCGG TTTTCTGGAA GGCGAGCATC GTTTGTTCGC CCAGGACTCT AGCTATAGTT
421 CTAGTGGTTG GCTACGTATA CTCCGGAATA TTAATAGATC ATGGAGATAA TTAATAATGAT
481 AACCATCTCG CAAATAAATA AGTATTTTAC TGTTTTCGTA ACAGTTTTGT AATAAAAAAA
541 CCTATAAATA TTCCGGATTA TTCATACCGT CCCACCATCG GGC CGGATC CATGGCCCCCT
601 ATACTAGGTT ATTGGAAAAT TAAGGGCCTT GTGCAACCCA CTCGACTTCT TTTGGAATAT
661 CTTGAAGAAA AATATGAAGA GCATTTGTAT GAGCGCGATG AAGGTGATAA ATGGCGAAAC
721 AAAAAGTTTG AATTGGGTTT GGAGTTTCCC AATCTTCCTT ATTATATTGA TGGTGATGTT
781 AAATTAACAC AGTCTATGGC CATCATACGT TATATAGCTG ACAAGCACAA CATGTTGGGT
841 GGTTGTCCAA AAGAGCGTGC AGAGATTTCA ATGCTTGAAG GAGCGGTTTT GGATATTAGA
901 TACGGTGTTT CGAGAATTGC ATATAGTAAA GACTTTGAAA CTCTCAAAGT TGATTTTCTT
961 AGCAAGCTAC CTGAAATGCT GAAAATGTTC GAAGATCGTT TATGTCATAA AACATATTTA
1021 AATGGTGATC ATGTAACCCA TCCTGACTTC ATGTTGTATG ACGCTCTTGA TGTGTTTTTA
1081 TACATGGACC CAATGTGCCT GGATGCGTTC CAAAATTAG TTTGTTTTAA AAAACGTATT
1141 GAAGCTATCC CACAAATTGA TAAGTACTTG AAATCCAGCA AGTATATAGC ATGGCCTTTG
1201 CAGGGCTGGC AAGCCACGTT TGGTGGTGGC GACCATCCTC CAAAATCGGA TCTGGTTCCG
1261 CGTCATAATC AAACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA TGATATAAAT
1321 ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG TAAAACACAA
1381 CATATCCAGT CACTATGGCG GCCGCATTAG GCACCCAGG CTTTACACTT TATGCTTCCG
1441 GCTCGTATGT TGTGTGGATT TTGAGTTAGG ATCCGGCGAG ATTTTCAGGA GCTAAGGAAG
1501 CTAAAATGGA GAAAAAATC ACTGGATATA CCACCGTTGA TATATCCCAA TGGCATCGTA
1561 AAGAACATTT TGAGGCATTT CAGTCAGTTG CTCAATGTAC CTATAACCAG ACCGTTTCAGC
1621 TGGATATTAC GGCCTTTTTA AAGACCGTAA AGAAAAATAA GCACAAGTTT TATCCGGCCT
1681 TTATTCACAT TCTTGCCCGC CTGATGAATG CTCATCCGGA ATTCCGTATG GCAATGAAAG
1741 ACGGTGAGCT GGTGATATGG GATAGTGTTT ACCCTTGTTA CACCGTTTTT CATGAGCAAA
1801 CTGAAACGTT TTCATCGCTC TGGAGTGAAT ACCACGACGA TTTCCGGCAG TTTCTACACA
1861 TATATTCGCA AGATGTGGCG TGTTACGGTG AAAACCTGGC CTATTTCCCT AAAGGGTTTA
1921 TTGAGAATAT GTTTTTCGTC TCAGCCAATC CCTGGGTGAG TTTCACCACT TTTGATTTAA

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FIG.40B

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1981	ACGTGGCCAA	TATGGACAAC	TTCTTCGCCC	CCGTTTTTCAC	CATGGGCAAA	TATTATACGC
2041	AAGGCGACAA	GGTGCTGATG	CCGCTGGCGA	TTCAGGTTCA	TCATGCCGTC	TGTGATGGCT
2101	TCCATGTCGG	CAGAATGCTT	AATGAATTAC	AACAGTACTG	CGATGAGTGG	CAGGGCGGGG
2161	CGTAATCTAG	AGGATCCGGC	TTACTAAAAG	CCAGATAACA	GTATGCGTAT	TTGCGCGCTG
2221	ATTTTTGCGG	TATAAGAATA	TATACTGATA	TGTATACCCG	AAGTATGTCA	AAAAGAGGTG
2281	TGCTATGAAG	CAGCGTATTA	CAGTGACAGT	TGACAGCGAC	AGCTATCAGT	TGCTCAAGGC
2341	ATATATGATG	TCAATATCTC	CGGTCTGGTA	AGCACAACCA	TGCAGAATGA	AGCCCGTCGT
2401	CTGCGTGCCG	AACGCTGGAA	AGCGGAAAAT	CAGGAAGGGA	TGGCTGAGGT	CGCCCGGTTT
2461	ATTGAAATGA	ACGGCTCTTT	TGCTGACGAG	AACAGGGACT	GGTGAATGC	AGTTTAAGGT
2521	TTACACCTAT	AAAAGAGAGA	GCCGTTATCG	TCTGTTTGTG	GATGTACAGA	GTGATATTAT
2581	TGACACGCC	GGGCGACGGA	TGGTGATCCC	CCTGGCCAGT	GCACGTCTGC	TGTCAGATAA
2641	AGTCTCCCGT	GAACCTTACC	CGGTGGTGCA	TATCGGGGAT	GAAAGCTGGC	GCATGATGAC
2701	CACCGATATG	GCCAGTGTGC	CGGTCTCCGT	TATCGGGGAA	GAAGTGGCTG	ATCTCAGCCA
2761	CCGCGAAAAT	GACATCAAAA	ACGCCATTAA	CCTGATGTTT	TGGGGAATAT	AAATGTCAGG
2821	CTCCCTTATA	CACAGCCAGT	CTGCAGGTCG	ACCATAGTGA	CTGGATATGT	TGTGTTTTAC
2881	AGTATTATGT	AGTCTGTTTT	TTATGCAAAA	TCTAATTTAA	TATATTGATA	TTTATATCAT
2941	TTTACGTTTC	TCGTTTCACT	TTCTTGACAA	AAGTGGTTTG	ATAGCTTGTC	GAGAAGTACT
3001	AGAGGATCAT	AATCAGCCAT	ACCACATTTG	TAGAGGTTTT	ACTTGCTTTA	AAAAACCTCC
3061	CACACCTCCC	CCTGAACCTG	AAACATAAAA	TGAATGCAAT	TGTTGTTGTT	AACTTGTTTA
3121	TTGCAGCTTA	TAATGGTTAC	AAATAAAGCA	ATAGCATCAC	AAATTTTACA	AATAAAGCAT
3181	TTTTTTTCACT	GCATTCTAGT	TGTGGTTTTG	CCAAACTCAT	CAATGTATCT	TATCATGTCT
3241	GGATCTGATC	ACTGCTTGAG	CCTAGGAGAT	CCGAACCAGA	TAAGTGAAAT	CTAGTTCCAA
3301	ACTATTTTGT	CATTTTTAAT	TTTCGTATTA	GCTTACGACG	CTACACCCAG	TTCCCATCTA
3361	TTTTGTCACT	CTTCCCTAAA	TAATCCTTAA	AAACTCCATT	TCCACCCCTC	CCAGTTCCCA
3421	ACTATTTTGT	CCGCCACAG	CGGGGCATTT	TTCTTCCTGT	TATGTTTTTA	ATCAAACATC
3481	CTGCCAACTC	CATGTGACAA	ACCGTCATCT	TCGGCTACTT	TTTCTCTGTC	ACAGAATGAA
3541	AATTTTTCTG	TCATCTCTTC	GTTATTAATG	TTTGTAATTG	ACTGAATATC	AACGCTTATT
3601	TGCAGCCTGA	ATGGCGAATG	GACGCGCCCT	GTAGCGGCGC	ATTAAGCGCG	GCGGGTGTGG
3661	TGGTTACGCG	CAGCGTGACC	GCTACACTTG	CCAGCGCCCT	AGCGCCCGCT	CCTTTCGCTT
3721	TCTTCCCTTC	CTTCTCGCC	ACGTTGCGCG	GCTTTCCTCCG	TCAAGCTCTA	AATCGGGGGC
3781	TCCCTTTAGG	GTTCCGATTT	AGTGCTTTAC	GGCACCTCGA	CCCCAAAAAA	CTTGATTAGG
3841	GTGATGGTTC	ACGTAGTGGG	CCATCGCCCT	GATAGACGGT	TTTTCGCCCT	TTGACGTTGG
3901	AGTCCACGTT	CTTTAATAGT	GGACTCTTGT	TCCAAACTGG	AACAACACTC	AACCCTATCT
3961	CGGTCTATTC	TTTTGATTTA	TAAGGGATTT	TGCCGATTTT	GGCCTATTGG	TTAAAAAATG
4021	AGCTGATTTA	ACAAAAATTT	AACGCGAATT	TTAACAAAAAT	ATTAACGTTT	ACAATTTTCAG
4081	GTGGCACTTT	TCGGGGAAAT	GTGCGCGGAA	CCCCTATTTG	TTTATTTTTT	TAAATACATT
4141	CAAATATGTA	TCCGCTCATG	AGACAATAAC	CCTGATAAAT	GCTTCAATAA	TATTGAAAAA
4201	GGAAGAGTAT	GAGTATTCAA	CATTTCCGTG	TCGCCCTTAT	TCCCTTTTTT	GCGGCATTTT
4261	GCCTTCCTGT	TTTTGCTCAC	CCAGAAACGC	TGGTGAAAGT	AAAAGATGCT	GAAGATCAGT
4321	TGGGTGCACG	AGTGGGTAC	ATCGAACTGG	ATCTCAACAG	CGGTAAGATC	CTTGAGAGTT
4381	TTCGCCCCGA	AGAACGTTTT	CCAATGATGA	GCACTTTTAA	AGTTCTGCTA	TGTGGCGCGG
4441	TATTATCCCG	TATTGACGCC	GGGCAAGAGC	AACTCGGTCG	CCGCATACAC	TATTCTCAGA
4501	ATGACTTGGT	TGAGTACTCA	CCAGTCACAG	AAAAGCATCT	TACGGATGGC	ATGACAGTAA

FIG.40C

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4561	GAGAATTATG	CAGTGCTGCC	ATAACCATGA	GTGATAACAC	TGCGGCCAAC	TTACTTCTGA
4621	CAACGATCGG	AGGACCGAAG	GAGCTAACCG	CTTTTTTGCA	CAACATGGGG	GATCATGTAA
4681	CTCGCCTTGA	TCGTTGGGAA	CCGGAGCTGA	ATGAAGCCAT	ACCAAACGAC	GAGCGTGACA
4741	CCACGATGCC	TGTAGCAATG	GCAACAACGT	TGCGCAAAC	ATTAAGTGGC	GAAGTACTTA
4801	CTCTAGCTTC	CCGGCAACAA	TTAATAGACT	GGATGGAGGC	GGATAAAGTT	GCAGGACCAC
4861	TTCTGCGCTC	GGCCCTTCCG	GCTGGCTGGT	TTATTGCTGA	TAAATCTGGA	GCCGGTGAGC
4921	GTGGGTCTCG	CGGTATCATT	GCAGCACTGG	GGCCAGATGG	TAAGCCCTCC	CGTATCGTAG
4981	TTATCTACAC	GACGGGGAGT	CAGGCAACTA	TGGATGAACG	AAATAGACAG	ATCGCTGAGA
5041	TAGGTGCCTC	ACTGATTAAG	CATTGGTAAC	TGTCAGACCA	AGTTTACTCA	TATATACTTT
5101	AGATTGATTT	AAAAC TTCAT	TTTTAATTTA	AAAGGATCTA	GGTGAAGATC	CTTTTTGATA
5161	ATCTCATGAC	CAAAATCCCT	TAACGTGAGT	TTTCGTTCCA	CTGAGCGTCA	GACCCCGTAG
5221	AAAAGATCAA	AGGATCTTCT	TGAGATCCTT	TTTTTCTGCG	CGTAATCTGC	TGCTTGCAAA
5281	CAAAAAAACC	ACCGCTACCA	GCGGTGGTTT	GTTTGCCGGA	TCAAGAGCTA	CCAACCTCTT
5341	TTCCGAAGGT	AACTGGCTTC	AGCAGAGCGC	AGATACCAAA	TACTGTCCTT	CTAGTGTAGC
5401	CGTAGTTAGG	CCACCACTTC	AAGAACTCTG	TAGCACCGCC	TACATACCTC	GCTCTGCTAA
5461	TCCTGTTACC	AGTGGCTGCT	GCCAGTGGCG	ATAAGTCGTG	TCTTACCGGG	TTGGACTCAA
5521	GACGATAGTT	ACCGGATAAG	GCGCAGCGGT	CGGGCTGAAC	GGGGGGTTCG	TGCACACAGC
5581	CCAGCTTGGA	GCGAACGACC	TACACCGAAC	TGAGATACCT	ACAGCGTGAG	CATTGAGAAA
5641	GCGCCACGCT	TCCCGAAGGG	AGAAAGGCGG	ACAGGTATCC	GGTAAGCGGC	AGGGTCGGAA
5701	CAGGAGAGCG	CACGAGGGAG	CTTCCAGGGG	GAAACGCCTG	GTATCTTTAT	AGTCCTGTGC
5761	GGTTTCGCCA	CCTCTGACTT	GAGCGTCGAT	TTTTGTGATG	CTCGTCAGGG	GGGCGGAGCC
5821	TATGGAAAAA	CGCCAGCAAC	GCGGCCTTTT	TACGGTTCCT	GGCCTTTTGC	TGGCCTTTTG
5881	CTCACATGTT	CTTTCCTGCG	TTATCCCTG	ATTCTGTGGA	TAACCGTATT	ACCGCCTTTG
5941	AGTGAGCTGA	TACCGCTCGC	CGCAGCCGAA	CGACCGAGCG	CAGCGAGTCA	GTGAGCGAGG
6001	AAGCGGAAGA	GCGCCTGATG	CGGTATTTTC	TCCTTACGCA	TCTGTGCGGT	ATTTACACCC
6061	GCAGACCAGC	CGCGTAACCT	GGCAAAATCG	GTTACGGTTG	AGTAATAAAT	GGATGCCCTG
6121	CGTAAGCGGG	TGTGGGCGGA	CAATAAAGTC	TTAAACTGAA	CAAAATAGAT	CTAAACTATG
6181	ACAATAAAGT	CTTAAACTAG	ACAGAATAGT	TGTAAACTGA	AATCAGTCCA	GTTATGCTGT
6241	GAAAAAGCAT	ACTGGACTTT	TGTTATGGCT	AAAGCAAAC	CTTCATTTTC	TGAAGTGCAA
6301	ATTGCCCGTC	GTATTAAAGA	GGGGCGTGGC	CAAGGGCATG	GTAAAGACTA	TATTCGCGGC
6361	GTTGTGACAA	TTTACCGAAC	AACTCCGCGG	CCGGGAAGCC	GATCTCGGCT	TGAACGAATT
6421	GTTAGGTGGC	GGTACTTGGG	TCGATATCAA	AGTGCATCAC	TTCTTCCCGT	ATGCCCAACT
6481	TTGTATAGAG	AGCCACTGCG	GGATCGTCAC	CGTAATCTGC	TTGCACGTAG	ATCACATAAG
6541	CACCAAGCGC	GTTGGCCTCA	TGCTTGAGGA	GATTGATGAG	CGCGGTGGCA	ATGCCCTGCC
6601	TCCGGTGCTC	GCCGGAGACT	GCGAGATCAT	AGATATAGAT	CTCACTACGC	GGCTGCTCAA
6661	ACCTGGGCAG	AACGTAAGCC	GCGAGAGCGC	CAACAACCGC	TTCTTGGTCG	AAGGCAGCAA
6721	GCGCGATGAA	TGTCTTACTA	CGGAGCAAGT	TCCCGAGGTA	ATCGGAGTCC	GGCTGATGTT
6781	GGGAGTAGGT	GGCTACGTCT	CCGAAC TAC	GACCGAAAAG	ATCAAGAGCA	GCCCGCATGG
6841	ATTTGACTTG	GTCAGGGCCG	AGCCTACATG	TGCGAATGAT	GCCCATACTT	GAGCCACCTA
6901	ACTTTGTTTT	AGGGCGACTG	CCCTGCTGCG	TAACATCGTT	GCTGCTGCGT	AACATCGTTG
6961	CTGCTCCATA	ACATCAAACA	TCGACCCACG	GCGTAACGCG	CTTGCTGCTT	GGATGCCCGA
7021	GGCATAGACT	GTACAAAAAA	ACAGTCATAA	CAAGCCATGA	AAACCG	

FIG.40D

2-HYBRID VECTOR WITH DNA-BINDING DOMAIN

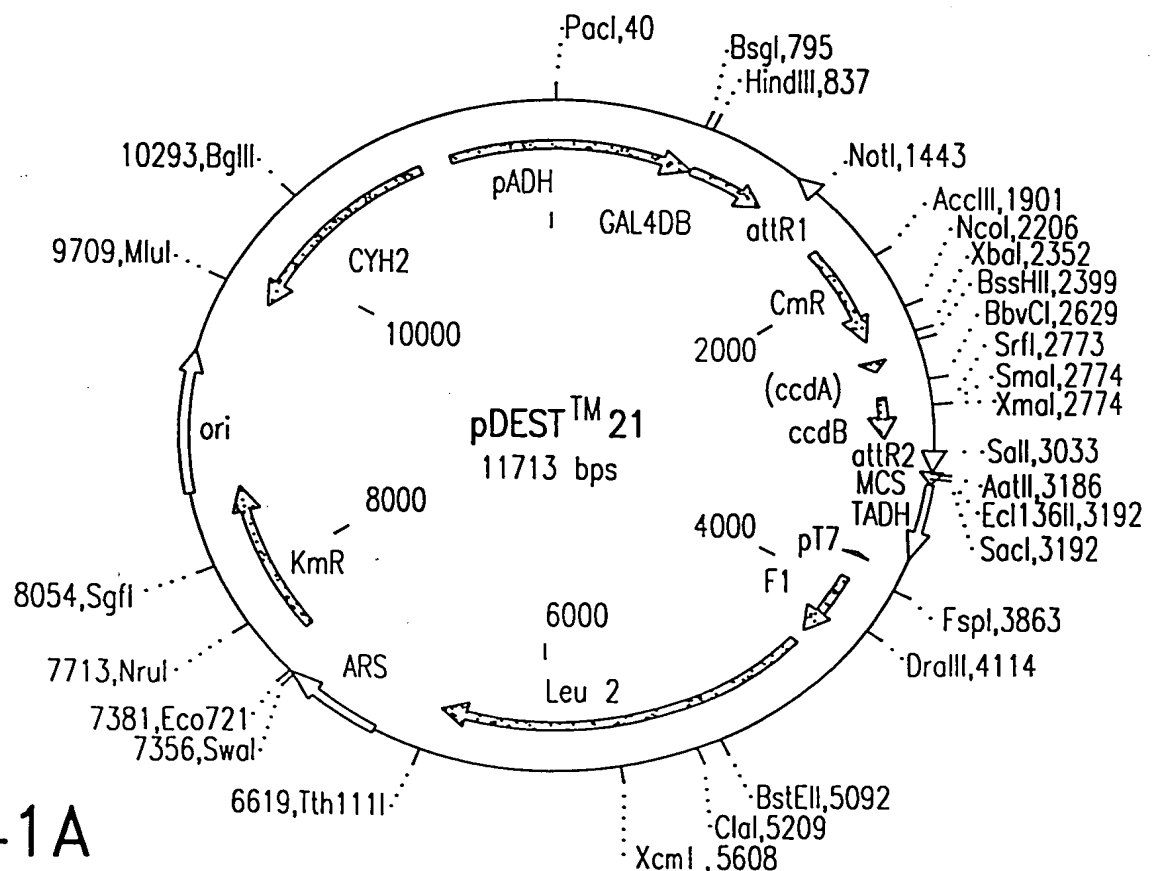
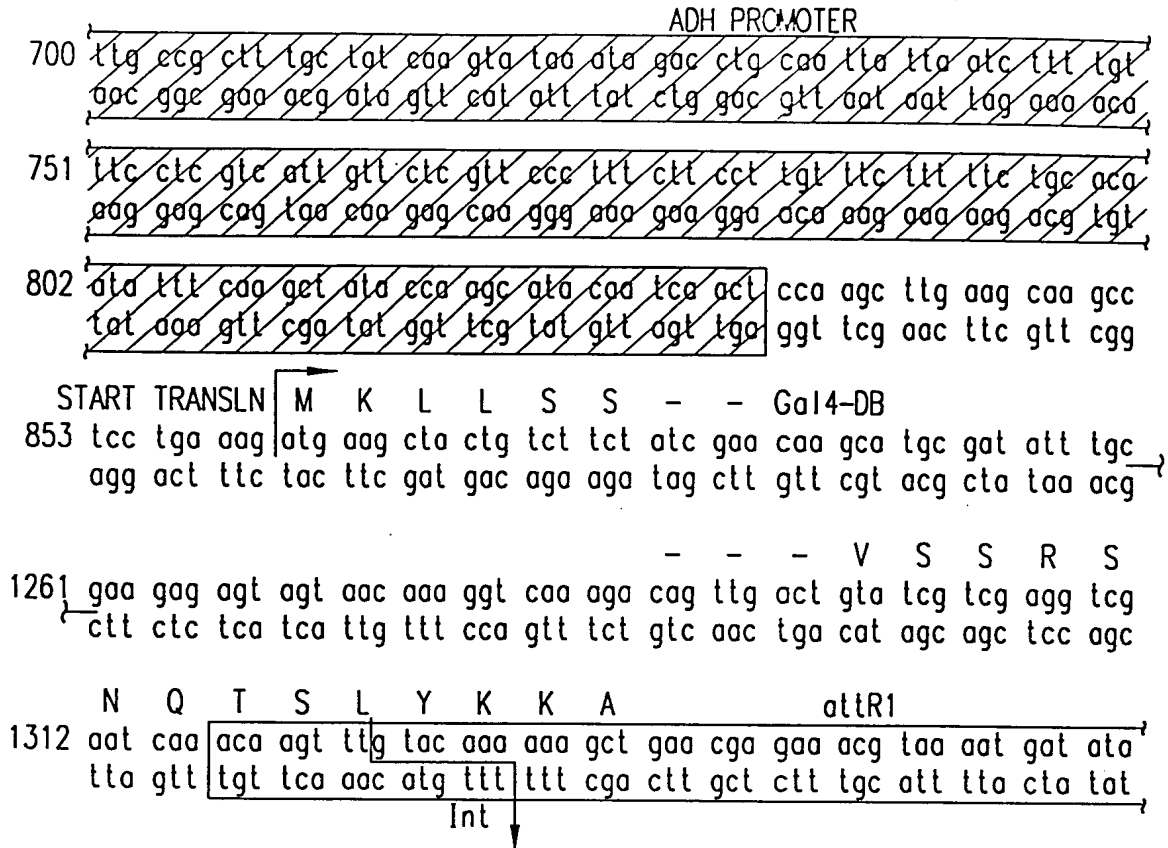


FIG.41A

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pDEST21 11713 bp (rotated to position 11000)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
857..1322	GAL4DB
1456..1332	attR1
1706..2365	CmR
2485..2569	inactivated ccdA
2707..3012	ccdB
3053..3177	attR2
3716..3735	pT7 (T7 promoter)
3899..4354	f1 (f1 intergenic region)
4414..6642	Leu2
7541..8515	kanR
9668..10958	CYH2
11118..848	pADH (ADH promoter)

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1  TTTATTATGT TACAATATGG AAGGGAAC TT TACACTTCTC CTATGCACAT ATATTAATTA
61 AAGTCCAATG CTAGTAGAGA AGGGGGGTAA CACCCCTCCG CGCTCTTTTC CGATTTTTTT
121 CTAAACCGTG GAATATTTTCG GATATCCTTT TGTGTTTCC GGGTGTACAA TATGGACTTC
181 CTCTTTTCTG GCAACCAAAC CCATACATCG GGATTCCTAT AATACCTTCG TTGGTCTCCC
241 TAACATGTAG GTGGCGGAGG GGAGATATAC AATAGAACAG ATACCAGACA AGACATAATG
301 GGCTAAACAA GACTACACCA ATTACACTGC CTCATTGATG GTGGTACATA ACGAACTAAT
361 ACTGTAGCCC TAGACTTGAT AGCCATCATC ATATCGAAGT TTCACTACCC TTTTTCATT
421 TGCCATCTAT TGAAGTAATA ATAGGCGCAT GCAACTTCTT TTCTTTTTTT TTCTTTTCTC
481 TCTCCCCCGT TGTTGTCTCA CCATATCCGC AATGACAAAA AAAATGATGG AAGACACTAA
541 AGGAAAAAAT TAACGACAAA GACAGCACCA ACAGATGTCG TTGTTCCAGA GCTGATGAGG
601 GGTATCTTCG AACACACGAA ACTTTTTCTT TCCTTCATTG ACGCACACTA CTCTCTAATG
661 AGCAACGGTA TACGGCCTTC CTTCCAGTTA CTTGAATTTG AAATAAAAAA AGTTTGCCGC
721 TTTGCTATCA AGTATAAATA GACCTGCAAT TATTAATCTT TTGTTTCTC GTCATTGTTC
781 TCGTTCCCTT TCTTCCTTGT TTCTTTTTCT GCACAATATT TCAAGCTATA CCAAGCATAC
841 AATCAACTCC AAGCTTGAAG CAAGCCTCCT GAAAGATGAA GCTACTGTCT TCTATCGAAC
901 AAGCATGCGA TATTTGCCGA CTTAAAAAGC TCAAGTGCTC CAAAGAAAAA CCGAAGTGCG
961 CCAAGTGTCT GAAGAACAAC TGGGAGTGTC GCTACTCTCC CAAAACCAA AGGTCTCCGC
1021 TGA CTAGGGC ACATCTGACA GAAGTGAAT CAAGGCTAGA AAGACTGGAA CAGCTATTTT
1081 TACTGATTTT TCCTCGAGAA GACCTTGACA TGATTTTGAA AATGGATTCT TTACAGGATA
1141 TAAAAGCATT GTTAACAGGA TTATTTGTAC AAGATAATGT GAATAAAGAT GCCGTCACAG
1201 ATAGATTGGC TTCAGTGGAG ACTGATATGC CTCTAACATT GAGACAGCAT AGAATAAGTG
1261 CGACATCATC ATCGGAAGAG AGTAGTAACA AAGGTCAAAG ACAGTTGACT GTATCGTCGA
1321 GGTCAATCA AACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAAT GATATAAATA
1381 TCAATATATT AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT AAAACACAAC
1441 ATATCCAGTC ACTATGGCGG CCGCTAAGTT GGCAGCATCA CCCGACGCAC TTTGCGCCGA
1501 ATAAATACCT GTGACGGAAG ATCACTTCGC AGAATAAATA AATCCTGGTG TCCCTGTTGA
1561 TACCGGGAAG CCCTGGGCCA ACTTTTGGCG AAAATGAGAC GTTGATCGGC ACGTAAGAGG
1621 TTCCAAC TTT CACCATAATG AAATAAGATC ACTACCGGGC GTATTTTTTG AGTTATCGAG
1681 ATTTTCAGGA GCTAAGGAAG CTAAAATGGA GAAAAAATC ACTGGATATA CCACCGTTGA

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FIG.41 B

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1741 TATATCCCAA TGGCATCGTA AAGAACATTT TGAGGCATTT CAGTCAGTTG CTCAATGTAC
1801 CTATAACCAG ACCGTTTCAGC TGGATATTAC GGCCTTTTTTA AAGACCGTAA AGAAAAATAA
1861 GCACAAGTTT TATCCGGCCT TTATTCACAT TCTTGCCCGC CTGATGAATG CTCATCCGGA
1921 ATTCCGTATG GCAATGAAAG ACGGTGAGCT GGTGATATGG GATAGTGTTT ACCCTTGTTA
1981 CACCGTTTTT CATGAGCAAA CTGAAACGTT TTCATCGCTC TGGAGTGAAT ACCACGACGA
2041 TTTCCGGCAG TTTCTACACA TATATTGCA AGATGTGGCG TGTTACGGTG AAAACCTGGC
2101 CTATTTCCCT AAAGGGTTTA TTGAGAATAT GTTTTTCGTC TCAGCCAATC CCTGGGTGAG
2161 TTTACCAGT TTTGATTTAA ACGTGGCCAA TATGGACAAC TTCTTCGCCC CCGTTTTTAC
2221 CATGGGCAAA TATTATACGC AAGGCGACAA GGTGCTGATG CCGCTGGCGA TTCAGGTTCA
2281 TCATGCCGTC TGTGATGGCT TCCATGTCGG CAGAATGCTT AATGAATTAC AACAGTACTG
2341 CGATGAGTGG CAGGGCGGGG CGTAATCTAG AGGATCCGGC TTAATAAAAG CCAGATAACA
2401 GTATGCGTAT TTGCGCGCTG ATTTTTCGGG TATAAGAATA TATACTGATA TGTATACCCG
2461 AAGTATGTCA AAAAGAGGTG TGCTATGAAG CAGCGTATTA CAGTGACAGT TGACAGCGAC
2521 AGCTATCAGT TGCTCAAGGC ATATATGATG TCAATATCTC CGGTCTGGTA AGCACAACCA
2581 TGCAGAATGA AGCCCGTCGT CTGCGTGCCG AACGCTGGAA AGCGGAAAT CAGGAAGGGA
2641 TGGCTGAGGT CGCCCGGTTT ATTGAAATGA ACGGCTCTTT TGCTGACGAG AACAGGGACT
2701 GGTGAAATGC AGTTTAAGGT TTACACCTAT AAAAGAGAGA GCCGTTATCG TCTGTTGTG
2761 GATGTACAGA GTGATATTAT TGACACGCCC GGGCGACGGA TGGTGATCCC CCTGGCCAGT
2821 GCACGTCTGC TGTCAGATAA AGTCTCCCGT GAACTTTACC CGGTGGTGCA TATCGGGGAT
2881 GAAAGCTGGC GCATGATGAC CACCGATATG GCCAGTGTGC CGGTCTCCGT TATCGGGGAA
2941 GAAGTGGCTG ATCTCAGCCA CCGCGAAAAT GACATCAAAA ACGCCATTAA CCTGATGTTT
3001 TGGGGAATAT AAATGTCAGG CTCCCTTATA CACAGCCAGT CTGCAGGTCG ACCATAGTGA
3061 CTGGATATGT TGTGTTTTAC AGTATTATGT AGTCTGTTTT TTATGCAAAA TCTAATTTAA
3121 TATATTGATA TTTATATCAT TTTACGTTTC TCGTTTCAGT TTCTTGTTACA AAGTGGTTTG
3181 ATGGCCGCTA AGTAAGTAAG ACGTCGAGCT CTAAGTAAGT AACGGCCGCC ACCGCGGTGG
3241 AGCTTTGGAC TTCTTCGCCA GAGGTTTGGT CAAGTCTCCA ATCAAGGTTG TCGGCTTGTC
3301 TACCTTGCCA GAAATTTACG AAAAGATGGA AAAGGGTCAA ATCGTTGGTA GATACGTTGT
3361 TGACACTTCT AAATAAGCGA ATTTCTTATG ATTTATGATT TTTATTATTA AATAAGTTAT
3421 AAAAAAATA AGTGTATACA AATTTTAAAG TGACTCTTAG GTTTTAAAC GAAATTTCTT
3481 ATTCTTGAGT AACTCTTTCC TGTAGGTCAG GTTGCTTTCT CAGGTATAGC ATGAGGTCGC
3541 TCTTATTGAC CACACCTCTA CCGGCATGCC GAGCAAATGC CTGCAAATCG CTCCCATT
3601 CACCCAATTG TAGATATGCT AACTCCAGCA ATGAGTTGAT GAATCTCGGT GTGTATTTTA
3661 TGTCTCAGA GGACAATACC TGTTGTAATC GTTCTTCCAC ACGGATCCCA ATTCGCCCTA
3721 TAGTGAGTCG TATTACAATT CACTGGCCGT CGTTTTACAA CGTCGTGACT GGGAAAACCC
3781 TGGCGTTACC CAACTTAATC GCCTTGACGC ACATCCCCCT TTCGCCAGCT GGCCTAATAG
3841 CGAAGAGGCC CGCACCGATC GCCCTTCCCA ACAGTTGCGC AGCCTGAATG GCGAATGGAC
3901 GCGCCCTGTA GCGGCGCATT AAGCGCGGCG GGTGTGGTGG TTACGCGCAG CGTGACCGCT
3961 AACTTGCCA GCGCCCTAGC GCCCGCTCCT TTCGCTTTCT TCCCTTCCTT TCTCGCCACG
4021 TTCGCCGGCT TTCCCGTCA AGCTCTAAAT CGGGGGCTCC CTTTAGGGTT CCGATTTAGT
4081 GCTTTACGGC ACCTCGACCC CAAAAAATT GATTAGGGTG ATGGTTCACG TAGTGGGCCA
4141 TCGCCCTGAT AGACGGTTTT TCGCCCTTTG ACGTTGGAGT CCACGTTCTT TAATAGTGGA
4201 CTCTTGTTCC AAAGTGAAC AACACTCAAC CCTATCTCGG TCTATTCTTT TGATTTATAA
4261 GGGATTTTGC CGATTTTCGGC CTATTGGTTA AAAAATGAGC TGATTTAACA AAAATTTAAC

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FIG.41C

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4321	GCGAATTTTA	ACAAAATATT	AACGTTTACA	ATTTCTGAT	GCGGTATTTT	CTCCTTACGC
4381	ATCTGTGCGG	TATTTACACAC	CGCATATCGA	CCGGTCGAGG	AGAACTTCTA	GTATATCCAC
4441	ATACCTAATA	TTATTGCCTT	ATTAAAAATG	GAATCGGAAC	AATTACATCA	AAATCCACAT
4501	TCTCTTCAAA	ATCAATTGTC	CTGTACTTCC	TTGTTTCATGT	GTGTTCAAAA	ACGTTATATT
4561	TATAGGATAA	TTATACTCTA	TTTCTCAACA	AGTAATTGGT	TGTTTGGCCG	AGCGGTCTAA
4621	GGCGCCTGAT	TCAAGAAATA	TCTTGACCGC	AGTTAACTGT	GGGAATACTC	AGGTATCGTA
4681	AGATGCAAGA	GTTCTGAATCT	CTTAGCAACC	ATTATTTTTT	TCCTCAACAT	AACGAGAACA
4741	CACAGGGGCG	CTATCGCACA	GAATCAAATT	CGATGACTGG	AAATTTTTTG	TTAATTTTCAG
4801	AGGTCGCCTG	ACGCATATAC	CTTTTTCAAC	TGAAAAATTG	GGAGAAAAAG	GAAAGGTGAG
4861	AGGCCGGAAC	CGGCTTTTCA	TATAGAATAG	AGAAGCGTTC	ATGACTAAAT	GCTTGCATCA
4921	CAATACTTGA	AGTTGACAAT	ATTATTTAAG	GACCTATTGT	TTTTTCCAAT	AGGTGGTTAG
4981	CAATCGTCTT	ACTTTCTAAC	TTTTCTTACC	TTTTACATTT	CAGCAATATA	TATATATATT
5041	TCAAGGATAT	ACCATTCTAA	TGTCTGCCCC	TATGTCTGCC	CCTAAGAAGA	TCGTCTTTTT
5101	GCCAGGTGAC	CACGTTGGTC	AAGAAATCAC	AGCCGAAGCC	ATTAAGGTTT	TTAAAGCTAT
5161	TTCTGATGTT	CGTTCCAATG	TCAAGTTCGA	TTTCGAAAAT	CATTTAATTG	GTGGTGCTGC
5221	TATCGATGCT	ACAGGTGTCC	CACTTCCAGA	TGAGGCGCTG	GAAGCCTCCA	AGAAGGTTGA
5281	TGCCGTTTTG	TTAGGTGCTG	TGGGTGGTCC	TAAATGGGGT	ACCGGTAGTG	TTAGACCTGA
5341	ACAAGGTTTA	CTAAAAATCC	GTAAAGAACT	TCAATTGTAC	GCCAACCTAA	GACCATGTAA
5401	CTTTGCATCC	GACTCTCTTT	TAGACTTATC	TCCAATCAAG	CCACAATTTG	CTAAAGGTAC
5461	TGACTTCGTT	GTTGTCAGAG	AATTAGTGGG	AGGTATTTAC	TTTGGTAAGA	GAAAGGAAGA
5521	CGATGGTGAT	GGTGTCGCTT	GGGATAGTGA	ACAATACACC	GTTCCAGAAG	TGCAAAGAAT
5581	CACAAGAATG	GCCGCTTTCA	TGGCCCTACA	ACATGAGCCA	CCATTGCCTA	TTTGGTCCTT
5641	GGATAAAGCT	AATGTTTTTG	CCTCTTCAAG	ATTATGGAGA	AAAACCTGTG	AGGAAACCAT
5701	CAAGAACGAA	TTCCCTACAT	TGAAGGTTCA	ACATCAATTG	ATTGATTCTG	CCGCCATGAT
5761	CCTAGTTAAG	AACCCAACCC	ACCTAAATGG	TATTATAATC	ACCAGCAACA	TGTTTGGTGA
5821	TATCATCTCC	GATGAAGCCT	CCGTTATCCC	AGGTTCTTG	GGTTTGTTGC	CATCTGCGTC
5881	CTTGGCCTCT	TTGCCAGACA	AGAACACCGC	ATTTGGTTTG	TACGAACCAT	GCCACGGTTC
5941	TGCTCCAGAT	TTGCCAAAGA	ATAAGGTTGA	CCCTATCGCC	ACTATCTTGT	CTGCTGCAAT
6001	GATGTTGAAA	TTGTCAATTGA	ACTTGCCTGA	AGAAGGTAAG	GCCATTGAAG	ATGCAGTTAA
6061	AAAGGTTTTG	GATGCAGGTA	TCAGAACTGG	TGATTTAGGT	GGTTCCAACA	GTACCACCGA
6121	AGTCGGTGAT	GCTGTCGCCG	AAGAAGTTAA	GAAAATCCTT	GCTTAAAAAG	ATTCTCTTTT
6181	TTTATGATAT	TTGTACATAA	ACTTTATAAA	TGAAATTCAT	AATAGAAACG	ACACGAAATT
6241	ACAAAATGGA	ATATGTTTCAT	AGGGTAGACG	AAACTATATA	CGCAATCTAC	ATACATTTAT
6301	CAAGAAGGAG	AAAAAGGAGG	ATAGTAAAGG	AATACAGGTA	AGCAAATTGA	TACTAATGGC
6361	TCAACGTGAT	AAGGAAAAAG	AATTGCACTT	TAACATTAAT	ATTGACAAGG	AGGAGGGCAC
6421	CACACAAAAA	GTTAGGTGTA	ACAGAAAATC	ATGAAACTAC	GATTCCTAAT	TTGATATTGG
6481	AGGATTTTCT	CTAAAAAAA	AAAAATACAA	CAAATAAAAA	AACTCAATG	ACCTGACCAT
6541	TTGATGGAGT	TTAAGTCAAT	ACCTTCTTGA	ACCATTTCCC	ATAATGGTGA	AAGTTCCCTC
6601	AAGAATTTTA	CTCTGTCAGA	AACGGCCTTA	CGACGTAGTC	GATATGGTGC	ACTCTCAGTA
6661	CAATCTGCTC	TGATGCCGCA	TAGTTAAGCC	AGCCCCGACA	CCCGCCAACA	CCCGCTGACG
6721	CGCCCTGACG	GGCTTGTCTG	CTCCCGGCAT	CCGCTTACAG	ACAAGCTGTG	ACCGTCTCCG
6781	GGAGCTGCAT	GTGTCAGAGG	TTTTCACCGT	CATCACCGAA	ACGCGCGAGA	CGAAAGGGCC
6841	TCGTGATACG	CCTATTTTTA	TAGGTTAATG	TCATGATAAT	AATGGTTTCT	TAGGACGGAT

FIG.41D

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6901	CGCTTGCCTG	TAACTTACAC	GCGCCTCGTA	TCTTTTAATG	ATGGAATAAT	TTGGGAATTT
6961	ACTCTGTGTT	TATTTATTTT	TATGTTTTGT	ATTTGGATTT	TAGAAAGTAA	ATAAAGAAGG
7021	TAGAAGAGTT	ACGGAATGAA	GAAAAAAAAA	TAAACAAAGG	TTTAAAAAAT	TTCAACAAAA
7081	AGCGTACTTT	ACATATATAT	TTATTAGACA	AGAAAAGCAG	ATTAAATAGA	TATACATTCTG
7141	ATTAACGATA	AGTAAATGT	AAAATCACAG	GATTTTCGTG	TGTGGTCTTC	TACACAGACA
7201	AGATGAAACA	ATTCGGCATT	AATACCTGAG	AGCAGGAAGA	GCAAGATAAA	AGGTAGTATT
7261	TGTTGGCGAT	CCCCCTAGAG	TCTTTTACAT	CTTCGGAAAA	CAAAAACATAT	TTTTTCTTTA
7321	ATTTCTTTTT	TTACTTTCTA	TTTTTAATTT	ATATATTTAT	ATTAAAAAAT	TTAAATTATA
7381	ATTATTTTTA	TAGCACGTGA	TGAAAAGGAC	CCAGGTGGCA	CTTTTCGGGG	AAATGTGCGC
7441	GGAACCCCTA	TTTGTTTATT	TTTCTAAATA	CATTCAAATA	TGTATCCGCT	CATGAGACAA
7501	TAACCCCTGAT	AAATGCTTCA	ATAATCTGCA	GCTCTGGCCC	GTGTCTCAAA	ATCTCTGATG
7561	TTACATTGCA	CAAGATAAAA	ATATATCATC	ATGAACAATA	AAACTGTCTG	CTTACATAAA
7621	CAGTAATACA	AGGGGTGTTA	TGAGCCATAT	TCAACGGGAA	ACGTCTTGCT	GGAGGCCGCG
7681	ATTAAATTCC	AACATGGATG	CTGATTTATA	TGGGTATAAA	TGGGCTCGCG	ATAATGTCCG
7741	GCAATCAGGT	GCGACAATCT	TTCGATTGTA	TGGGAAGCCC	GATGCGCCAG	AGTTGTTTCT
7801	GAAACATGGC	AAAGGTAGCG	TTGCCAATGA	TGTTACAGAT	GAGATGGTCA	GACTAAACTG
7861	GCTGACGGAA	TTTATGCCTC	TTCCGACCAT	CAAGCATTTT	ATCCGTACTC	CTGATGATGC
7921	ATGGTACTC	ACCACTGCGA	TCCGCGGGAA	AACAGCATTC	CAGGTATTAG	AAGAATATCC
7981	TGATTCAGGT	GAAAATATTG	TTGATGCGCT	GGCAGTGTTT	CTGCGCCGGT	TGCATTGAT
8041	TCCTGTTTGT	AATTGTCCTT	TTAACAGCGA	TCGCGTATTT	CGTCTCGCTC	AGGCGCAATC
8101	ACGAATGAAT	AACGGTTTGG	TTGATGCGAG	TGATTTTGAT	GACGAGCGTA	ATGGCTGGCC
8161	TGTTGAACAA	GTCTGGAAAG	AAATGCATAC	GCTTTTGCCA	TTCTCACCGG	ATTCAGTCGT
8221	CACTCATGGT	GATTTCTCAC	TTGATAACCT	TATTTTGTAC	GAGGGGAAAT	TAATAGGTTG
8281	TATTGATGTT	GGACGAGTCG	GAATCGCAGA	CCGATACCAG	GATCTTGCCA	TCCTATGGAA
8341	CTGCCTCGGT	GAGTTTTCTC	CTTCATTACA	GAAACGGCTT	TTTCAAAAAT	ATGGTATTGA
8401	TAATCCTGAT	ATGAATAAAT	TGCAGTTTCA	TTTGATGCTC	GATGAGTTTT	TCTAATCAGA
8461	ATTGGTTAAT	TGGTTGTAAC	ACTGGCAGAG	CATTACGCTG	ACTTGACGGG	ACGGCGCATG
8521	ACCAAAATCC	CTTAACGTGA	GTTTTCGTTC	CACTGAGCGT	CAGACCCCGT	AGAAAAGATC
8581	AAAGGATCTT	CTTGAGATCC	TTTTTTCTG	CGCGTAATCT	GCTGCTTGCA	AACAAAAAAA
8641	CCACCGCTAC	CAGCGGTGGT	TTGTTTGCCG	GATCAAGAGC	TACCAACTCT	TTTTCCGAAG
8701	GTAACCTGGT	TCAGCAGAGC	GCAGATACCA	AATACTGTCC	TTCTAGTGTA	GCCGTAGTTA
8761	GGCCACCACT	TCAAGAACTC	TGTAGCACCG	CCTACATACC	TCGCTCTGCT	AATCCTGTTA
8821	CCAGTGGCTG	CTGCCAGTGG	CGATAAGTCG	TGTCTTACCG	GGTTGGACTC	AAGACGATAG
8881	TTACCGGATA	AGGCGCAGCG	GTCGGGCTGA	ACGGGGGGTT	CGTGCACACA	GCCCAGCTTG
8941	GAGCGAACGA	CCTACACCGA	ACTGAGATAC	CTACAGCGTG	AGCATTGAGA	AAGCGCCACG
9001	CTTCCCGAAG	GGAGAAAGGC	GGACAGGTAT	CCGGTAAGCG	GCAGGGTCGG	AACAGGAGAG
9061	CGCACGAGGG	AGCTTCCAGG	GGGGAACGCC	TGGTATCTTT	ATAGTCCTGT	CGGGTTTCGC
9121	CACCTCTGAC	TTGAGCGTCG	ATTTTTGTGA	TGCTCGTCAG	GGGGGCCGAG	CCTATGGAAA
9181	AACGCCAGCA	ACGCGGCCTT	TTTACGGTTC	CTGGCCTTTT	GCTGGCCTTT	TGCTCACATG
9241	TTCTTTCCTG	CGTTATCCCC	TGATTCTGTG	GATAACCGTA	TTACCGCCTT	TGAGTGAGCT
9301	GATACCGCTC	GCCGCAGCCG	AACGACCGAG	CGCAGCGAGT	CAGTGAGCGA	GGAAGCGGAA
9361	GAGCGCCCAA	TACGCAAACC	GCCTCTCCCC	GCGCGTTGGC	CGATTCAATTA	ATGCAGCTGG
9421	CACGACAGGT	TTCCCGACTG	GAAAGCGGGC	AGTGAGCGCA	ACGCAATTAA	TGTGAGTTAC

FIG.41E

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9481 CTCACTCATT AGGCACCCCA GGCTTTACAC TTTATGCTTC CGGCTCCTAT GTTGTGTGGA
9541 ATTGTGAGCG GATAACAATT TCACACAGGA AACAGCTATG ACCATGATTA CGCCAAGCTC
9601 GGAATTAACC CTCACTAAAG GGAACAAAAG CTGGTACCGA TCCCGAGCTT TGCAAATTAA
9661 AGCCTTCGAG CGTCCCAAAA CCTTCTCAAG CAAGGTTTTT AGTATAATGT TACATGCGTA
9721 CACGCGTCTG TACAGAAAAA AAAGAAAAAT TTGAAATATA AATAACGTTT TTAATACTAA
9781 CATAACTATA AAAAAATAAA TAGGGACCTA GACTTCAGGT TGTCTAACTC CTTCTTTTTC
9841 GGTTAGAGCG GATGTGGGGG GAGGGCGTGA ATGTAAGCGT GACATAACTA ATTACATGAT
9901 ATCGACAAAG GAAAAGGGGC CTGTTTACTC ACAGGCTTTT TTCAAGTAGG TAATTAAGTC
9961 GTTTCTGTCT TTTTCCTTCT TCAACCCACC AAAGGCCATC TTGGTACTTT TTTTTTTTTT
10021 TTTTTTTTTT TTTTTTTTTT TTTTTTTTTT TTTTTTTTTT TTTTTTTTTT TTTTTTTTTT
10081 TTTTTTTTTT TTTTTTTTTT TCATAGAAAT AATACAGAAG TAGATGTTGA ATTAGATTAA
10141 ACTGAAGATA TATAATTTAT TGGAAAATAC ATAGAGCTTT TTGTTGATGC GCTTAAGCGA
10201 TCAATTCAAC AACACCACCA GCAGCTCTGA TTTTTCTTC AGCCAACTTG GAGACGAATC
10261 TAGCTTTGAC GATAACTGGA ACATTTGGAA TTCTACCCTT ACCCAAGATC TTACCGTAAC
10321 CGGCTGCCAA AGTGTCAATA ACTGGAGCAG TTTCTTAGA AGCAGATTTT AAGTATTGGT
10381 CTCTCTTGTC TTCTGGGATC AATGTCCACA ATTTGTCCAA GTTCAAGACT GGCTTCCAGA
10441 AATGAGCTTG TTGCTTGTTG AAGTATCTCA TACCAACCTT ACCGAAATAA CCTGGATGGT
10501 ATTTATCCAT GTTAATTCTG TGGTGATGTT GACCACGGC CATACCTCTA CCACCGGGT
10561 GCTTTCTGTG CTTACCGATA CGACCTTTAC CGGCTGAGAC GTGACCTCTG TGCTTTCTAG
10621 TCTTAGTGAA TCTGGAAGGC ATTCTTGATT AGTTGGATGA TTGTTCTGGG ATTTAATGCA
10681 AAAATCACTT AAGAAGGAAA ATCAACGGAG AAAGCAAACG CCATCTTAAA TATACGGGAT
10741 ACAGATGAAA GGGTTTGAAC CTATCTGGAA AATAGCATT AACAAGCGAA AACTGCGAG
10801 GAAAATTGTT TGCGTCTCTG CGGGCTATTC ACGCGCCAGA GGAAAATAGG AAAAATAACA
10861 GGGCATTAGA AAAATAATTT TGATTTTGGT AATGTGTGGG TCCTGGTGTA CAGATGTTAC
10921 ATTGGTTACA GTACTCTTGT TTTTGCTGTG TTTTTCGATG AATCTCCAAA ATGGTTGTTA
10981 GCACATGGAA GAGTCACCGA TGCTAAGTTA TCTCTATGTA AGCTACGTGG CGTGACTTTT
11041 GATGAAGCCG CACAAGAGAT ACAGGATTGG CAACTGCAAA TAGAATCTGG GGATCCCCC
11101 TCGAGATCCG GGATCGAAGA AATGATGGTA AATGAAATAG GAAATCAAGG AGCATGAAGG
11161 CAAAAGACAA ATATAAGGGT CGAACGAAAA ATAAAGTGAA AAGTGTTGAT ATGATGTATT
11221 TGGCTTTGCG GCGCCGAAAA AACGAGTTTA CGCAATTGCA CAATCATGCT GACTCTGTGG
11281 CGGACCCGCG CTCTTGCCGG CCCGGCGATA ACGCTGGGCG TGAGGCTGTG CCCGGCGGAG
11341 TTTTTTGCGC CTGCATTTTC CAAGGTTTAC CCTGCGCTAA GGGGCGAGAT TGGAGAAGCA
11401 ATAAGAATGC CGGTTGGGGT TGCATGATG ACGACCACGA CAACTGGTGT CATTATTTAA
11461 GTTGCCGAAA GAACCTGAGT GCATTTGCAA CATGAGTATA CTAGAAGAAT GAGCCAAGAC
11521 TTGCGAGACG CGAGTTTGCC GGTGGTGCGA ACAATAGAGC GACCATGACC TTGAAGGTGA
11581 GACGCGCATA ACCGCTAGAG TACTTTGAAG AGGAAACAGC AATAGGGTTG CTACCAGTAT
11641 AAATAGACAG GTACATACAA CACTGGAAT GGTGTCTGT TTGAGTACGC TTTCAATTCA
11701 TTTGGGTGTG CAC

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FIG.41F

2-HYBRID VECTOR WITH ACTIVATION DOMAIN

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657 acg cac act act ctc taa tga gca acg gla tac ggc ctt cct tcc agt tac
tgc gtg tga tga gag att act cgt tgc cat atg ccg gaa gga agg tca atg

708 ttg aat ttg aaa taa aaa aag ttt gcc gct ttg cta tca agt ata aat aga
aac tta aac ttt att ttt ttc aaa cgg cga aac gat agt tca tat tta tct

759 cct gca att att aat ctt ttg ttt cct cgt cat tgt tct cgt tcc ctt tct
gga cgt taa taa tta gaa aac aaa gga gca gla aca aga gca agg gaa aga

ADH PROMOTER

810 tce ttg ttt ctt ttt ctg cac aat att tca agc tat ace aag cat aca atc
agg aac aag gaa aag aac gtg tta taa agt tca ata tgg ttc gla tgt tgg

861 aac tcc aag ctt atg ccc aag aag aag cgg aag glc tgc agc ggc gcc aat
ttg ggg ttc gaa tac ggg ttc ttc ttc gcc ttc cag agc tgc ccg cgg tta
M P K K Gal4-AD
START TRANSLATION

1218 gaa gat acc cca cca aac cca aaa aaa gag ggt ggg tgc aat caa aca agt
ctt cta tgg ggt ggt ttg ggt ttt ttt ctc cca ccc agc tta gtt tgt tca
D G G S N Q T S

L Y K K A attR1
1269 ttg tac aaa aaa gct gaa cga gaa acg taa a
aac atg ttt ttt cga ctt gct ctt tgc att t

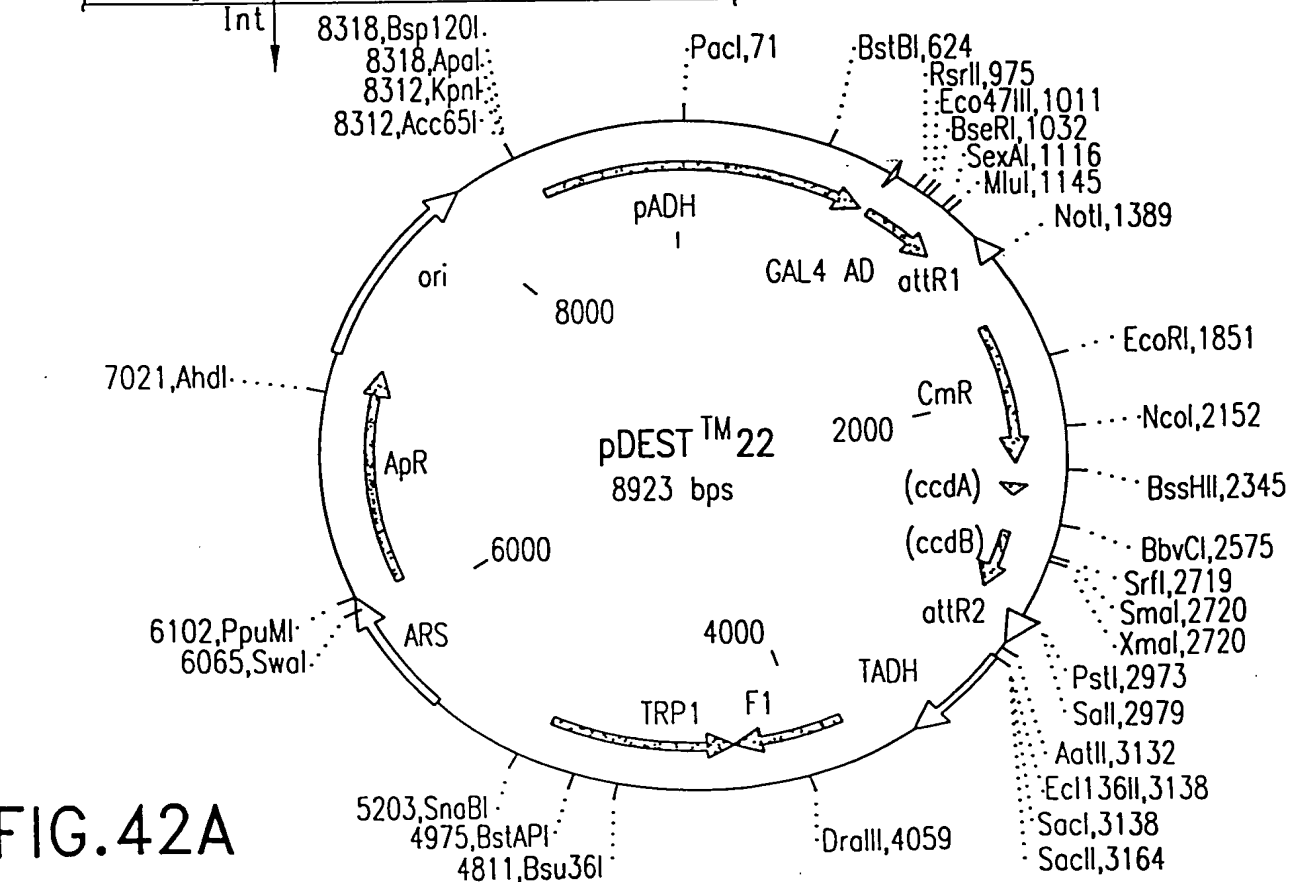


FIG.42A

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pDEST22 8923 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
904..1248	GAL4 AD
1388..1264	attR1
1638..2297	CmR
2417..2501	inactivated ccdA
2639..2944	ccdB
2985..3109	attR2
3831..4318	f1 (f1 intergenic region)
4334..5176	TRP1
6110..7194	ampR
8344..866	pADH (yeast ADH promoter)

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1  TTCATTTGGG TGTGCACTTT ATTATGTTAC AATATGGAAG GGAACTTTAC ACTTCTCCTA
61  TGCACATATA TTAATTAAAG TCCAATGCTA GTAGAGAAGG GGGGTAACAC CCCTCCGCGC
121 TCTTTTCCGA TTTTTTCTA AACCGTGGA TATTTCCGAT ATCCTTTTGT TGTTTCCGGG
181 TGTACAATAT GGACTTCCTC TTTTCTGGCA ACCAAACCCA TACATCGGGA TTCCTATAAT
241 ACCTTCGTTG GTCTCCCTAA CATGTAGGTG GCGGAGGGGA GATATACAAT AGAACAGATA
301 CCAGACAAGA CATAATGGGC TAAACAAGAC TACACCAATT ACACTGCCTC ATTGATGGTG
361 GTACATAACG AACTAATACT GTAGCCCTAG ACTTGATAGC CATCATCATA TCGAAGTTTC
421 ACTACCCTTT TTCCATTTGC CATCTATTGA AGTAATAATA GGCGCATGCA ACTTCTTTTC
481 TTTTTTTTTT TTTTCTCTCT CCCCCGTTGT TGTCTCACCA TATCCGCAAT GACAAAAAAA
541 ATGATGGAAG AACTAAAGG AAAAAATTAA CGACAAAGAC AGCACCAACA GATGTCGTTG
601 TTCCAGAGCT GATGAGGGGT ATCTTCGAAC ACACGAAACT TTTTCCTTCC TTCATTACAG
661 CACACTACTC TCTAATGAGC AACGGTATAC GGCCTTCCTT CCAGTTACTT GAATTTGAAA
721 TAAAAAAAGT TTGCCGCTTT GCTATCAAGT ATAAATAGAC CTGCAATTAT TAATCTTTTG
781 TTTCTCGTC ATTGTTCTCG TTCCCTTTCT TCCTTGTTTC TTTTCTGCA CAATATTTCA
841 AGCTATACCA AGCATACAAT CAACTCCAAG CTTATGCCCC AGAAGAAGCG GAAGGTCTCG
901 AGCGGCGCCA ATTTTAATCA AAGTGGAAT ATTGCTGATA GCTCATTGTC CTTCACTTTC
961 ACTAACAGTA GCAACGGTCC GAACCTCATA ACAACTCAAA CAAATTCTCA AGCGCTTTCA
1021 CAACCAATTG CCTCCTCTAA CGTTCATGAT AACTTCATGA ATAATGAAAT CACGGCTAGT
1081 AAAATTGATG ATGGTAATAA TTCAAAACCA CTGTCACCTG GTTGACGGA CCAAACCTGCG
1141 TATAACGCGT TTGGAATCAC TACAGGGATG TTTAATACCA CTACAATGGA TGATGTATAT
1201 AACTATCTAT TCGATGATGA AGATACCCCA CCAAACCCAA AAAAAGAGGG TGGGTCGAAT
1261 CAAACAAGTT TGTACAAAAA AGCTGAACGA GAAACGTAAA ATGATATAAA TATCAATATA
1321 TTAAATTAGA TTTTGCATAA AAAACAGACT ACATAATACT GTAAAACACA ACATATCCAG
1381 TCACTATGGC GGCCGCTAAG TTGGCAGCAT CACCCGACGC ACTTTGCGCC GAATAAATAC
1441 CTGTGACGGA AGATCACTTC GCAGAATAAA TAAATCCTGG TGTCCTGTT GATACCGGGA
1501 AGCCCTGGGC CAACTTTTGG CGAAAATGAG ACGTTGATCG GCACGTAAGA GGTTCCTCACT
1561 TTCACCATAA TGAAATAAGA TCACTACCGG GCGTATTTTT TGAGTTATCG AGATTTTCAG
1621 GAGCTAAGGA AGCTAAAATG GAGAAAAAAA TCACTGGATA TACCACCGTT GATATATCCC
1681 AATGGCATCG TAAAGAACAT TTTGAGGCAT TTCAGTCAGT TGCTCAATGT ACCTATAACC
1741 AGACCGTTCA GCTGGATATT ACGGCCTTTT TAAAGACCGT AAAGAAAAAT AAGCACAAGT
1801 TTTATCCGGC CTTTATTCAC ATTCTTGCCC GCCTGATGAA TGCTCATCCG GAATTCCGTA

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FIG.42B

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1861	TGGCAATGAA	AGACGGTGAG	CTGGTGATAT	GGGATAGTGT	TCACCCTTGT	TACACCGTTT
1921	TCCATGAGCA	AACTGAAACG	TTTTCATCGC	TCTGGAGTGA	ATACCACGAC	GATTTCCGGC
1981	AGTTTCTACA	CATATATTCG	CAAGATGTGG	CGTGTTACGG	TGAAAACCTG	GCCTATTTCC
2041	CTAAAGGGTT	TATTGAGAAT	ATGTTTTTCG	TCTCAGCCAA	TCCCTGGGTG	AGTTTCACCA
2101	GTTTTGATTT	AAACGTGGCC	AATATGGACA	ACTTCTTCGC	CCCCGTTTTT	ACCATGGGCA
2161	AATATTATAC	GCAAGGCGAC	AAGGTGCTGA	TGCCGCTGGC	GATTCAGGTT	CATCATGCCG
2221	TCTGTGATGG	CTTCCATGTC	GGCAGAATGC	TTAATGAATT	ACAACAGTAC	TGCGATGAGT
2281	GGCAGGGCGG	GGCGTAATCT	AGAGGATCCG	GCTTACTAAA	AGCCAGATAA	CAGTATGCGT
2341	ATTTGCGCGC	TGATTTTTGC	GGTATAAGAA	TATATACTGA	TATGTATACC	CGAAGTATGT
2401	CAAAAAGAGG	TGTGCTATGA	AGCAGCGTAT	TACAGTGACA	GTTGACAGCG	ACAGCTATCA
2461	GTTGCTCAAG	GCATATATGA	TGTCAATATC	TCCGGTCTGG	TAAGCACAAC	CATGCAGAAT
2521	GAAGCCCCTC	GTCTGCGTGC	CGAACGCTGG	AAAGCGGAAA	ATCAGGAAGG	GATGGCTGAG
2581	GTCGCCCGGT	TTATTGAAAT	GAACGGCTCT	TTTGCTGACG	AGAACAGGGA	CTGGTGAAAT
2641	GCAGTTTAAG	GTTTACACCT	ATAAAAGAGA	GAGCCGTTAT	CGTCTGTTTG	TGGATGTACA
2701	GAGTGATATT	ATTGACACGC	CCGGGCGACG	GATGGTGATC	CCCCTGGCCA	GTGCACGTCT
2761	GCTGTCAGAT	AAAGTCTCCC	GTGAACTTTA	CCCGGTGGTG	CATATCGGGG	ATGAAAGCTG
2821	GCGCATGATG	ACCACCGATA	TGGCCAGTGT	GCCGGTCTCC	GTTATCGGGG	AAGAAGTGGC
2881	TGATCTCAGC	CACCGCGAAA	ATGACATCAA	AAACGCCATT	AACCTGATGT	TCTGGGGAAT
2941	ATAAATGTCA	GGCTCCCTTA	TACACAGCCA	GTCTGCAGGT	CGACCATAGT	GACTGGATAT
3001	GTTGTGTTTT	ACAGTATTAT	GTAGTCTGTT	TTTTATGCAA	AATCTAATTT	AATATATTGA
3061	TATTTATATC	ATTTTACGTT	TCTCGTTCAG	CTTTCTTGTA	CAAAGTGGTT	TGATGGCCGC
3121	TAAGTAAGTA	AGACGTCGAG	CTCTAAGTAA	GTAACGGCCG	CCACCGCGGT	GGAGCTTTGG
3181	ACTTCTTCGC	CAGAGGTTTG	GTCAAGTCTC	CAATCAAGGT	TGTCGGCTTG	TCTACCTTGC
3241	CAGAAATTTA	CGAAAAGATG	GAAAAGGGTC	AAATCGTTGG	TAGATACGTT	GTTGACACTT
3301	CTAAATAAGC	GAATTTCTTA	TGATTTATGA	TTTTTATTAT	TAAATAAGTT	ATAAAAAAAAA
3361	TAAGTGTATA	CAAATTTTAA	AGTGA CTCTT	AGGTTTTAAA	ACGAAAATTC	TTATTCTTGA
3421	GTA ACTCTTT	CCTGTAGGTC	AGGTTGCTTT	CTCAGGTATA	GCATGAGGTC	GCTCTTATTG
3481	ACCACACCTC	TACCGGCATG	CCGAGCAAAT	GCCTGCAAAT	CGCTCCCCAT	TTCACCCAAT
3541	TGTAGATATG	CTAACTCCAG	CAATGAGTTG	ATGAATCTCG	GTGTGTATTT	TATGTCCTCA
3601	GAGGACAATA	CCTGTTGTAA	TCGTTCTTCC	ACACGGATCC	CAATTCGCCC	TATAGTGAGT
3661	CGTATTACAA	TTCACTGGCC	GTCGTTTTAC	AACGTCGTGA	CTGGGAAAAC	CCTGGCGTTA
3721	CCCAACTTAA	TCGCCTTGCA	GCACATCCCC	CTTTCGCCAG	CTGGCGTAAT	AGCGAAGAGG
3781	CCCGCACCGA	TCGCCCTTCC	CAACAGTTGC	GCAGCCTGAA	TGGCGAATGG	ACGCGCCCTG
3841	TAGCGGCGCA	TTAAGCGCGG	CGGGTGTGGT	GGTTACGCGC	AGCGTGACCG	CTACACTTGC
3901	CAGCGCCCTA	GCGCCCGCTC	CTTTCGCTTT	CTTCCCTTCC	TTTCTCGCCA	CGTTCGCCGG
3961	CTTTCGCCGT	CAAGCTCTAA	ATCGGGGGCT	CCCTTTAGGG	TTCCGATTTA	GTGCTTTACG
4021	GCACCTCGAC	CCCAAAAAAC	TTGATTAGGG	TGATGGTTCA	CGTAGTGGGC	CATCGCCCTG
4081	ATAGACGGTT	TTTCGCCCTT	TGACGTTGGA	GTCCACGTTT	TTTAATAGTG	GA CTCTTGTT
4141	CCAAACTGGA	ACAACACTCA	ACCCTATCTC	GGTCTATTCT	TTTGATTTAT	AAGGGATTTT
4201	GCCGATTTTC	GCCTATTGGT	TAAAAAATGA	GCTGATTTAA	CAAAAATTTA	ACGCGAATTT
4261	TAACAAAATA	TTAACGTTTA	CAATTTCTCT	ATGCGGTATT	TTCTCCTTAC	GCATCTGTGC
4321	GGTATTTTAC	ACCGCAGGCA	AGTGCACAAA	CAATACTTAA	ATAAATACTA	CTCAGTAATA
4381	ACCTATTTCT	TAGCATTTTT	GACGAAATTT	GCTATTTTGT	TAGAGTCTTT	TACACCATTT

FIG.42C

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4441 GTCTCCACAC CTCCGCTTAC ATCAACACCA ATAACGCCAT TTAATCTAAG CGCATCACCA
4501 ACATTTTCTG GCGTCAGTCC ACCAGCTAAC ATAAAATGTA AGCTTTCGGG GCTCTCTTGC
4561 CTTCCAACCC AGTCAGAAAT CGAGTTCCAA TCCAAAAGTT CACCTGTCCC ACCTGCTTCT
4621 GAATCAAACA AGGGAATAAA CGAATGAGGT TTCTGTGAAG CTGCACTGAG TAGTATGTTG
4681 CAGTCTTTTG GAAATACGAG TCTTTTAATA ACTGGCAAAC CGAGGAACTC TTGGTATTCT
4741 TGCCACGACT CATCTCCATG CAGTTGGACG ATATCAATGC CGTAATCATT GACCAGAGCC
4801 AAAACATCCT CCTTAGGTTG ATTACGAAAC ACGCCAACCA AGTATTTTCG AGTGCCTGAA
4861 CTATTTTTAT ATGCTTTTAC AAGACTTGAA ATTTTCCTTG CAATAACCGG GTCAATTGTT
4921 CTCTTTCTAT TGGGCACACA TATAATACCC AGCAAGTCAG CATCGGAATC TAGAGCACAT
4981 TCTGCGGCCT CTGTGCTCTG CAAGCCGCAA ACTTTCACCA ATGGACCAGA ACTACCTGTG
5041 AAATTAATAA CAGACATACT CCAAGCTGCC TTTGTGTGCT TAATCACGTA TACTCACGTG
5101 CTCAATAGTC ACCAATGCCC TCCCTCTTGG CCCTCTCCTT TTCTTTTTTC GACCGAATTA
5161 ATTCTTAATC GGCAAAAAAA GAAAAGCTCC GGATCAAGAT TGTACGTAAG GTGACAAGCT
5221 ATTTTTCAT AAAGAATATC TTCCACTACT GCCATCTGGC GTCATAACTG CAAAGTACAC
5281 ATATATTACG ATGCTGTCTA TTAAATGCTT CCTATATTAT ATATATAGTA ATGTCGTTTA
5341 TGGTGCACCTC TCAGTACAAT CTGCTCTGAT GCCGCATAGT TAAGCCAGCC CCGACACCCG
5401 CCAACACCCG CTGACGCGCC CTGACGGGCT TGTCTGCTCC CGGCATCCGC TTACAGACAA
5461 GCTGTGACCG TCTCCGGGAG CTGCATGTGT CAGAGGTTTT CACCGTCATC ACCGAAACGC
5521 GCGAGACGAA AGGGCCTCGT GATACGCTA TTTTATAGG TTAATGTCAT GATAATAATG
5581 GTTTCTTAGG ACGGATCGCT TGCCTGTAAC TTACACGCGC CTCGTATCTT TTAATGATGG
5641 AATAATTTGG GAATTTACTC TGTGTTTATT TATTTTATG TTTTGTATT GGATTTTAGA
5701 AAGTAAATAA AGAAGGTAGA AGAGTTACGG AATGAAGAAA AAAAAATAAA CAAAGGTTTA
5761 AAAAATTTCA ACAAAAAGCG TACTTTACAT ATATATTTAT TAGACAAGAA AAGCAGATTA
5821 AATAGATATA CATTCGATTA ACGATAAGTA AAATGTAAAA TCACAGGATT TTCGTGTGTG
5881 GTCTTCTACA CAGACAAGAT GAAACAATTC GGCATTAATA CCTGAGAGCA GGAAGAGCAA
5941 GATAAAAGGT AGTATTTGTT GGCATCCCC CTAGAGTCTT TTACATCTTC GGAAAAACAA
6001 AACTATTTTT TCTTTAATTT CTTTTTTTAC TTTCTATTT TAATTTATAT ATTTATATTA
6061 AAAAATTTAA ATTATAATTA TTTTATAGC ACGTGATGAA AAGGACCCAG GTGGCACTTT
6121 TCGGGGAAAT GTGCGCGGAA CCCCTATTG TTTATTTTC TAAATACATT CAAATATGTA
6181 TCCGCTCATG AGACAATAAC CCTGATAAAT GCTTCAATAA TATTGAAAAA GGAAGAGTAT
6241 GAGTATTCAA CATTTCCGTG TCGCCCTTAT TCCCTTTTTT GCGGCATTTT GCCTTCCTGT
6301 TTTTGCTCAC CCAGAAACGC TGGTGAAAGT AAAAGATGCT GAAGATCAGT TGGGTGCACG
6361 AGTGGGTTAC ATCGAACTGG ATCTCAACAG CGGTAAGATC CTTGAGAGTT TTCGCCCGA
6421 AGAACGTTTT CCAATGATGA GCACTTTTAA AGTTCTGCTA TGTGGCGCGG TATTATCCCG
6481 TATTGACGCC GGGCAAGAGC AACTCGGTG CCGCATAAC TATTCTCAGA ATGACTTGGT
6541 TGAGTACTCA CCAGTCACAG AAAAGCATCT TACGGATGGC ATGACAGTAA GAGAATTATG
6601 CAGTGCTGCC ATAACCATGA GTGATAACAC TGCGGCCAAC TTAATTCTGA CAACGATCGG
6661 AGGACCGAAG GAGCTAACCG CTTTTTTTCA CAACATGGGG GATCATGTAA CTCGCCTTGA
6721 TCGTTGGGAA CCGGAGCTGA ATGAAGCCAT ACCAAACGAC GAGCGTGACA CCACGATGCC
6781 TGAGCAATG GCAACAACGT TGCGCAAAC ATTAACCTGG GAACTACTTA CTCTAGCTTC
6841 CCGGCAACAA TTAATAGACT GGATGGAGGC GGATAAAGTT GCAGGACCAC TTCTGCGCTC
6901 GGCCCTTCCG GCTGGCTGGT TTATTGCTGA TAAATCTGGA GCCGGTGAGC GTGGGTCTCG
6961 CGGTATCATT GCAGCACTGG GGCCAGATGG TAAGCCCTCC CGTATCGTAG TTATCTACAC

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FIG.42D

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7021	GACGGGCAGT	CAGGCAACTA	TGGATGAACG	AAATAGACAG	ATCGCTGAGA	TAGGTGCCTC
7081	ACTGATTAAG	CATTGGTAAC	TGTCAGACCA	AGTTTACTCA	TATATACTTT	AGATTGATTT
7141	AAAAC TTCAT	TTTTAATTTA	AAAGGATCTA	GGTGAAGATC	CTTTTTGATA	ATCTCATGAC
7201	CAAAATCCCT	TAACGTGAGT	TTTCGTTCCA	CTGAGCGTCA	GACCCCGTAG	AAAAGATCAA
7261	AGGATCTTCT	TGAGATCCTT	TTTTTCTGCG	CGTAATCTGC	TGCTTGCAAA	CAAAAAAACC
7321	ACCGCTACCA	GCGGTGGTTT	GTTTGCCGGA	TCAAGAGCTA	CCAACTCTTT	TTCCGAAGGT
7381	AACTGGCTTC	AGCAGAGCGC	AGATACCAAA	TACTGTCCTT	CTAGTGTAGC	CGTAGTTAGG
7441	CCACCACTTC	AAGAACTCTG	TAGCACC GCC	TACATACCTC	GCTCTGCTAA	TCCTGTTACC
7501	AGTGGCTGCT	GCCAGTGGCG	ATAAGTCGTG	TCTTACCGGG	TTGGACTCAA	GACGATAGTT
7561	ACCGGATAAG	GCGCAGCGGT	CGGGCTGAAC	GGGGGGTTTCG	TGCACACAGC	CCAGCTTGGA
7621	GCGAACGACC	TACACCGAAC	TGAGATACCT	ACAGCGTGAG	CATTGAGAAA	GCGCCACGCT
7681	TCCCGAAGGG	AGAAAGGCGG	ACAGGTATCC	GGTAAGCGGC	AGGGTCGGAA	CAGGAGAGCG
7741	CACGAGGGAG	CTTCCAGGGG	GGAACGCCTG	GTATCTTTAT	AGTCCTGTCTG	GGTTTCGCCA
7801	CCTCTGACTT	GAGCGTCGAT	TTTTGTGATG	CTCGTCAGGG	GGGCCGAGCC	TATGGAAAAA
7861	CGCCAGCAAC	GCGGCCTTTT	TACGGTTCTT	GGCCTTTTGC	TGGCCTTTTG	CTCACATGTT
7921	CTTTCCTGCG	TTATCCCCTG	ATTCTGTGGA	TAACCGTATT	ACCGCCTTTG	AGTGAGCTGA
7981	TACCGCTCGC	CGCAGCCGAA	CGACCGAGCG	CAGCGAGTCA	GTGAGCGAGG	AAGCGGAAGA
8041	GCGCCCAATA	CGCAAACCGC	CTCTCCCCGC	GCGTTGGCCG	ATTCATTAAT	GCAGCTGGCA
8101	CGACAGGTTT	CCCGACTGGA	AAGCGGGCAG	TGAGCGCAAC	GCAATTAATG	TGAGTTACCT
8161	CACTCATTAG	GCACCCCAGG	CTTTACACTT	TATGCTTCCG	GCTCCTATGT	TGTGTGGAAT
8221	TGTGAGCGGA	TAACAATTTT	ACACAGGAAA	CAGCTATGAC	CATGATTACG	CCAAGCTCGG
8281	AATTAACCCT	CACTAAAGGG	AACAAAAGCT	GGGTACCGGG	CCCCCCTCG	AGATCCGGGA
8341	TCGAAGAAAT	GATGGTAAAT	GAAATAGGAA	ATCAAGGAGC	ATGAAGGCAA	AAGACAAATA
8401	TAAGGGTCGA	ACGAAAAATA	AAGTGAAAAG	TGTTGATATG	ATGTATTTGG	CTTTGCGGCG
8461	CCGAAAAAAC	GAGTTTACGC	AATTGCACAA	TCATGCTGAC	TCTGTGGCGG	ACCGCGCTC
8521	TTGCCGGCCC	GGCGATAACG	CTGGGCGTGA	GGCTGTGCCC	GGCGGAGTTT	TTTGCGCCTG
8581	CATTTTCCAA	GGTTTACCCT	GCGCTAAGGG	GCGAGATTGG	AGAAGCAATA	AGAATGCCGG
8641	TTGGGGTTGC	GATGATGACG	ACCACGACAA	CTGGTGTCAT	TATTTAAGTT	GCCGAAAGAA
8701	CCTGAGTGCA	TTTGCAACAT	GAGTATACTA	GAAGAATGAG	CCAAGACTTG	CGAGACGCGA
8761	GTTTGCCGGT	GGTGCGAACA	ATAGAGCGAC	CATGACCTTG	AAGGTGAGAC	GCGCATAACC
8821	GCTAGAGTAC	TTTGAAGAGG	AAACAGCAAT	AGGGTTGCTA	CCAGTATAAA	TAGACAGGTA
8881	CATACAACAC	TGGAAATGGT	TGTCTGTTTG	AGTACGCTTT	CAA	

FIG.42E

FIG. 43A

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pDEST23 6264 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
285..161	attR1
394..1053	CmR
1173..1257	inactivated ccdA
1395..1700	ccdB
1741..1865	attR2
1883..1911	his6
2574..3434	ampR
3583..4222	ori

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1 TCTTCCCCAT CGGTGATGTC GGCATATAG GCGCCAGCAA CCGCACCTGT GGCGCCGGTG
61 ATGCCGGCCA CGATGCGTCC GGCCTAGAGG ATCGAGATCT CGATCCCGCG AAATTAATAC
121 GACTCACTAT AGGGAGACCA CAACGGTTTC CCTCTAGATC ACAAGTTTGT ACAAAAAAGC
181 TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA AATTAGATTT TGCATAAAAA
241 ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC CGCATTAGGC
301 ACCCCAGGCT TTACACTTTA TGCTTCCGGC TCGTATAATG TGTGGATTTT GAGTTAGGAT
361 CCGGCGAGAT TTTCAGGAGC TAAGGAAGCT AAAATGGAGA AAAAAATCAC TGGATATACC
421 ACCGTTGATA TATCCCAATG GCATCGTAA GAACATTTTG AGGCATTTC A GTCAGTTGCT
481 CAATGTACCT ATAACCAGAC CGTTCAGCTG GATATTACGG CCTTTTTAAA GACCGTAAAG
541 AAAAATAAGC ACAAGTTTTA TCCGGCCTTT ATTCACATTC TTGCCCGCCT GATGAATGCT
601 CATCCGGAAT TCCGTATGGC AATGAAAGAC GGTGAGCTGG TGATATGGGA TAGTGTTTAC
661 CCTTGTTACA CCGTTTTCCA TGAGCAAAC GAAACGTTTT CATCGCTCTG GAGTGAATAC
721 CACGACGATT TCCGGCAGTT TCTACACATA TATTCGCAAG ATGTGGCGTG TTACGGTGAA
781 AACCTGGCCT ATTTCCCTAA AGGGTTTATT GAGAATATGT TTTTCGTCTC AGCCAATCCC
841 TGGGTGAGTT TCACCAGTTT TGATTAAAC GTGGCCAATA TGGACAACTT CTTGCCCCC
901 GTTTTCACCA TGGGCAAATA TTATACGCAA GGCGACAAGG TGCTGATGCC GCTGGCGATT
961 CAGGTTTCATC ATGCCGTCTG TGATGGCTTC CATGTCGGCA GAATGCTTAA TGAATTACAA
1021 CAGTACTGCG ATGAGTGGCA GGGCGGGGCG TAAACGCGTG GATCCGGCTT ACTAAAAGCC
1081 AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGCGGTA TAAGAATATA TACTGATATG
1141 TATACCCGAA GTATGTCAAA AAGAGGTGTG CTATGAAGCA GCGTATTACA GTGACAGTTG
1201 ACAGCGACAG CTATCAGTTG CTCAAGGCAT ATATGATGTC AATATCTCCG GTCTGGTAAG
1261 CACAACCATG CAGAATGAAG CCCGTCGTCT GCGTGCCGAA CGCTGGAAAG CGGAAAATCA
1321 GGAAGGGATG GCTGAGGTCG CCCGGTTTAT TGAAATGAAC GGCTCTTTTG CTGACGAGAA
1381 CAGGGACTGG TGAAATGCAG TTTAAGGTTT ACACCTATAA AAGAGAGAGC CGTTATCGTC
1441 TGTTTGTGGA TGTACAGAGT GATATTATTG ACACGCCCGG GCGACGGATG GTGATCCCCC
1501 TGGCCAGTGC ACGTCTGCTG TCAGATAAAG TCTCCCGTGA ACTTTACCCG GTGGTGCATA
1561 TCGGGGATGA AAGCTGGCGC ATGATGACCA CCGATATGGC CAGTGTGCCG GTCTCCGTTA
1621 TCGGGGAAGA AGTGGCTGAT CTCAGCCACC GCGAAAATGA CATCAAAAAC GCCATTAACC
1681 TGATGTTCTG GGGAATATAA ATGTCAGGCT CCCTTATACA CAGCCAGTCT GCAGGTCGAC

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FIG.43B

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1741	CATAGTGACT	GGATATGTTG	TGTTTTACAG	TATTATGTAG	TCTGTTTTTT	ATGCAAAATC
1801	TAATTTAATA	TATTGATATT	TATATCATTT	TACGTTTCTC	G TTCAGCTTT	CTTGTACAAA
1861	GTGGTGATTA	TGTCGTACTA	CCATCACCAT	CACCATCACC	TCGATGAGCA	ATAACTAGCA
1921	TAACCCCTTG	GGGCCTCTAA	ACGGGTCTTG	AGGGGTTTTT	TGCTGAAAGG	AGGAACTATA
1981	TCCGGATATC	CACAGGACGG	GTGTGGTCGC	CATGATCGCG	TAGTCGATAG	TGGCTCCAAG
2041	TAGCGAAGCG	AGCAGGACTG	GGCGGCGGCC	AAAGCGGTCG	GACAGTGCTC	CGAGAACGGG
2101	TGCGCATAGA	AATTGCATCA	ACGCATATAG	CGCTAGCAGC	ACGCCATAGT	GACTGGCGAT
2161	GCTGTCGGAA	TGGACGATAT	CCCGCAAGAG	GCCCGGCAGT	ACCGGCATAA	CCAAGCCTAT
2221	GCCTACAGCA	TCCAGGGTGA	CGGTGCCGAG	GATGACGATG	AGCGCATTGT	TAGATTTTCAT
2281	ACACGGTGCC	TGACTGCGTT	AGCAATTTAA	CTGTGATAAA	CTACCGCATT	AAAGCTTATC
2341	GATGATAAGC	TGTCAAACAT	GAGAATTCTT	GAAGACGAAA	GGGCCTCGTG	ATACGCCTAT
2401	TTTTATAGGT	TAATGTCATG	ATAATAATGG	TTTCTTAGAC	GTCAGGTGGC	ACTTTTCGGG
2461	GAAATGTGCG	CGGAACCCCT	ATTTGTTTAT	TTTTCTAAAT	ACATTCAAAT	ATGTATCCGC
2521	TCATGAGACA	ATAACCCTGA	TAAATGCTTC	AATAATATTG	AAAAAGGAAG	AGTATGAGTA
2581	TTCAACATTT	CCGTGTCGCC	CTTATTCCCT	TTTTTGCGGC	ATTTTGCTT	CCTGTTTTTG
2641	CTCACCCAGA	AACGCTGGTG	AAAGTAAAAG	ATGCTGAAGA	TCAGTTGGGT	GCACGAGTGG
2701	GTTACATCGA	ACTGGATCTC	AACAGCGGTA	AGATCCTTGA	GAGTTTTTCG	CCCGAAGAAC
2761	GTTTTCCAAT	GATGAGCACT	TTTAAAGTTC	TGCTATGTGG	CGCGGTATTA	TCCCGTGTTG
2821	ACGCCGGGCA	AGAGCAACTC	GGTCGCCGCA	TACACTATTC	TCAGAATGAC	TTGGTTGAGT
2881	ACTCACCAGT	CACAGAAAAG	CATCTTACGG	ATGGCATGAC	AGTAAGAGAA	TTATGCAGTG
2941	CTGCCATAAC	CATGAGTGAT	AACACTGCGG	CCAACTTACT	TCTGACAACG	ATCGGAGGAC
3001	CGAAGGAGCT	AACCGCTTTT	TTGCACAACA	TGGGGGATCA	TGTAAGTCGC	CTTGATCGTT
3061	GGGAACCGGA	GCTGAATGAA	GCCATACCAA	ACGACGAGCG	TGACACCACG	ATGCCTGCAG
3121	CAATGGCAAC	AACGTTGCGC	AAACTATTAA	CTGGCGAACT	ACTTACTCTA	GCTTCCCGGC
3181	AACAATTAAT	AGACTGGATG	GAGGCGGATA	AAGTTGCAGG	ACCACTTCTG	CGCTCGGCCC
3241	TTCCGGCTGG	CTGGTTTATT	GCTGATAAAT	CTGGAGCCGG	TGAGCGTGGG	TCTCGCGGTA
3301	TCATTGCAGC	ACTGGGGCCA	GATGGTAAGC	CCTCCCGTAT	CGTAGTTATC	TACACGACGG
3361	GGAGTCAGGC	AACTATGGAT	GAACGAAATA	GACAGATCGC	TGAGATAGGT	GCCTCACTGA
3421	TTAAGCATTG	GTAAGTGTCA	GACCAAGTTT	ACTCATATAT	ACTTTAGATT	GATTTAAAAC
3481	TTCATTTTTA	ATTTAAAAGG	ATCTAGGTGA	AGATCCTTTT	TGATAATCTC	ATGACCAAAA
3541	TCCCTTAACG	TGAGTTTTTCG	TTCCACTGAG	CGTCAGACCC	CGTAGAAAAG	ATCAAAGGAT
3601	CTTCTTGAGA	TCCTTTTTTT	CTGCGCGTAA	TCTGCTGCTT	GCAAACAAAA	AAACCACCGC
3661	TACCAGCGGT	GGTTTGTTTG	CCGGATCAAG	AGCTACCAAC	TCTTTTTCCG	AAGGTAAGTG
3721	GCTTCAGCAG	AGCGCAGATA	CCAAATACTG	TCCTTCTAGT	G TAGCCGTAG	TTAGGCCACC
3781	ACTTCAAGAA	CTCTGTAGCA	CCGCCTACAT	ACCTCGCTCT	GCTAATCCTG	TTACCAGTGG
3841	CTGCTGCCAG	TGGCGATAAG	TCGTGTCTTA	CCGGGTGGA	CTCAAGACGA	TAGTTACCGG
3901	ATAAGGCGCA	GCGGTCGGGC	TGAACGGGGG	GTTCGTGCAC	ACAGCCCAGC	TTGGAGCGAA
3961	CGACCTACAC	CGAACTGAGA	TACCTACAGC	GTGAGCTATG	AGAAAGCGCC	ACGCTTCCCG
4021	AAGGGAGAAA	GGCGGACAGG	TATCCGGTAA	GCGGCAGGGT	CGGAACAGGA	GAGCGCACGA

FIG.43C

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4081 GGGAGCTTCC AGGGGGAAAC GCCTGGTATC TTTATAGTCC TGTCGGGTTT CGCCACCTCT
4141 GACTTGAGCG TCGATTTTTG TGATGCTCGT CAGGGGGGCG GAGCCTATGG AAAAACGCCA
4201 GCAACGCGGC CTTTTTACGG TTCCTGGCCT TTTGCTGGCC TTTTGCTCAC ATGTTCTTTC
4261 CTGCGTTATC CCCTGATTCT GTGGATAACC GTATTACCGC CTTTGAGTGA GCTGATACCG
4321 CTCGCCGAG CCGAACGACC GAGCGCAGCG AGTCAGTGAG CGAGGAAGCG GAAGAGCGCC
4381 TGATGCGGTA TTTTCTCCTT ACGCATCTGT GCGGTATTTT ACACCGCATA TATGGTGCAC
4441 TCTCAGTACA ATCTGCTCTG ATGCCGCATA GTTAAGCCAG TATACTACTCC GCTATCGCTA
4501 CGTGACTGGG TCATGGCTGC GCCCGACAC CCGCCAACAC CCGCTGACGC GCCCTGACGG
4561 GCTTGTCTGC TCCCGGCATC CGCTTACAGA CAAGCTGTGA CCGTCTCCGG GAGCTGCATG
4621 TGTCAGAGGT TTTCACCGTC ATCACCGAAA CGCGCGAGGC AGCTGCGGTA AAGCTCATCA
4681 GCGTGGTCTG GAAGCGATTG ACAGATGTCT GCCTGTTCAT CCGCGTCCAG CTCGTTGAGT
4741 TTCTCCAGAA GCGTTAATGT CTGGCTTCTG ATAAAGCGGG CCATGTTAAG GCGGTTTTTT
4801 TCCTGTTTGG TCACTGATGC CTCCTGTGTA GGGGGATTTC TGTTTCATGGG GGTAATGATA
4861 CCGATGAAAC GAGAGAGGAT GCTCACGATA CGGGTACTG ATGATGAACA TGCCCGGTTA
4921 CTGGAACGTT GTGAGGGTAA ACAACTGGCG GTATGGATGC GGCGGGACCA GAGAAAAATC
4981 ACTCAGGGTC AATGCCAGCG CTTCTGTTAAT ACAGATGTAG GTGTTCCACA GGGTAGCCAG
5041 CAGCATCCTG CGATGCAGAT CCGGAACATA ATGGTGCAGG GCGCTGACTT CCGCGTTTCC
5101 AGACTTTACG AAACACGGAA ACCGAAGACC ATTCATGTTG TTGCTCAGGT CGCAGACGTT
5161 TTGCAGCAGC AGTCGCTTCA CGTTCGCTCG CGTATCGGTG ATTCATTCTG CTAACCAGTA
5221 AGGCAACCCC GCCAGCCTAG CCGGGTCTC AACGACAGGA GCACGATCAT GCGCACCCGT
5281 GGCCAGGACC CAACGCTGCC CGAGATGCGC CGCGTGCGGC TGCTGGAGAT GCGGACGCG
5341 ATGGATATGT TCTGCCAAGG GTTGTTTTGC GCATTCACAG TTCTCCGCAA GAATTGATTG
5401 GCTCCAATTC TTGGAGTGGT GAATCCGTTA GCGAGGTGCC GCCGGCTTCC ATTCAGGTGCG
5461 AGGTGGCCCG GCTCCATGCA CCGCGACGCA ACGCGGGGAG GCAGACAAGG TATAGGGCGG
5521 CGCTACAAT CCATGCCAAC CCGTTCCATG TGCTCGCCGA GCGGCATAA ATCGCCGTGA
5581 CGATCAGCGG TCCAGTGATC GAAGTTAGGC TGGTAAGAGC CGCGAGCGAT CCTTGAAGCT
5641 GTCCCTGATG GTCGTCATCT ACCTGCCTGG ACAGCATGGC CTGCAACGCG GGCATCCCGA
5701 TGCCGCCGGA AGCGAGAAGA ATCATAATGG GGAAGGCCAT CCAGCCTCGC GTCGCGAACG
5761 CCAGCAAGAC GTAGCCAGC GCGTCGGCCG CCATGCCGGC GATAATGGCC TGCTTCTCGC
5821 CGAAACGTTT GGTGGCGGGA CCAGTGACGA AGGCTTGAGC GAGGGCGTGC AAGATTCCGA
5881 ATACCGCAAG CGACAGGCCG ATCATCGTCG CGCTCCAGCG AAAGCGGTCC TCGCCGAAAA
5941 TGACCCAGAG CGCTGCCGGC ACCTGTCCTA CGAGTTGCAT GATAAAGAAG ACAGTCATAA
6001 GTGCGGCGAC GATAGTCATG CCCC GCGCCC ACCGGAAGGA GCTGACTGGG TTGAAGGCTC
6061 TCAAGGGCAT CGGTCGATCG ACGCTCTCCC TTATGCGACT CCTGCATTAG GAAGCAGCCC
6121 AGTAGTAGGT TGAGGCCGTT GAGCACC GCCGCAAGGA ATGGTGCATG CAAGGAGATG
6181 GCGCCCAACA GTCCCCGGC CACGGGGCCT GCCACCATAC CCACGCCGAA ACAAGCGCTC
6241 ATGAGCCCGA AGTGGCGAGC CCGA

FIG.43D

pDEST24
GST CARBOXY-FUSION VECTOR, T7 PROMOTER

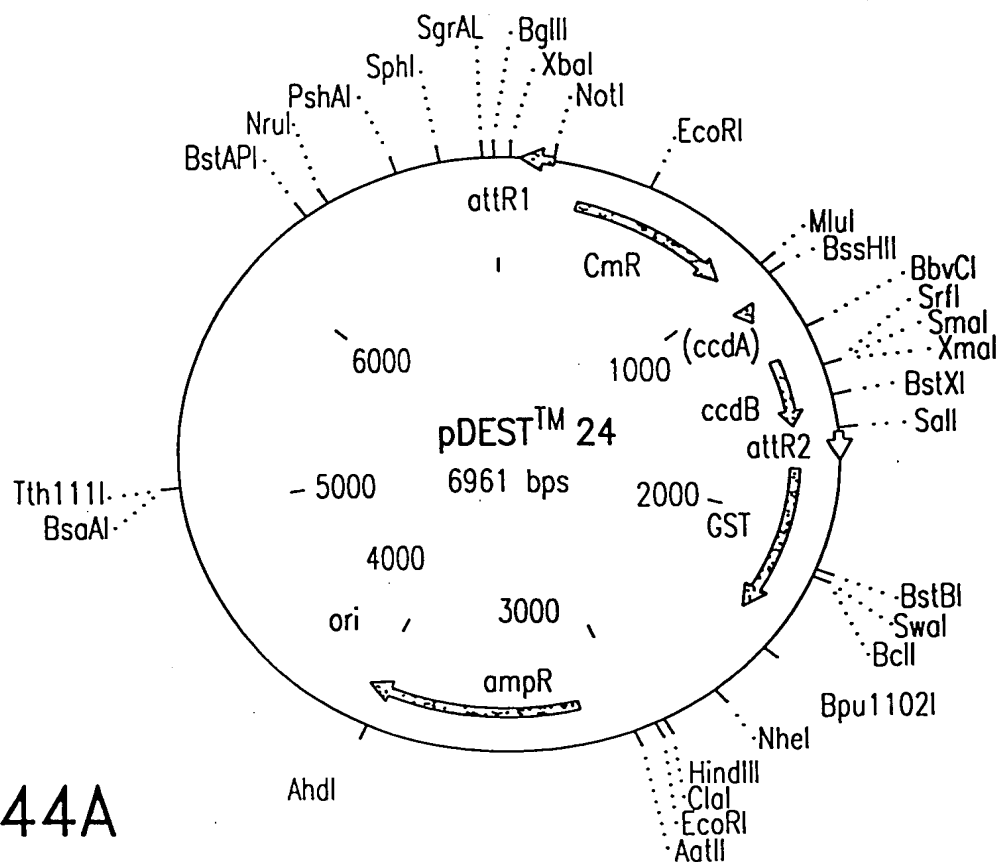
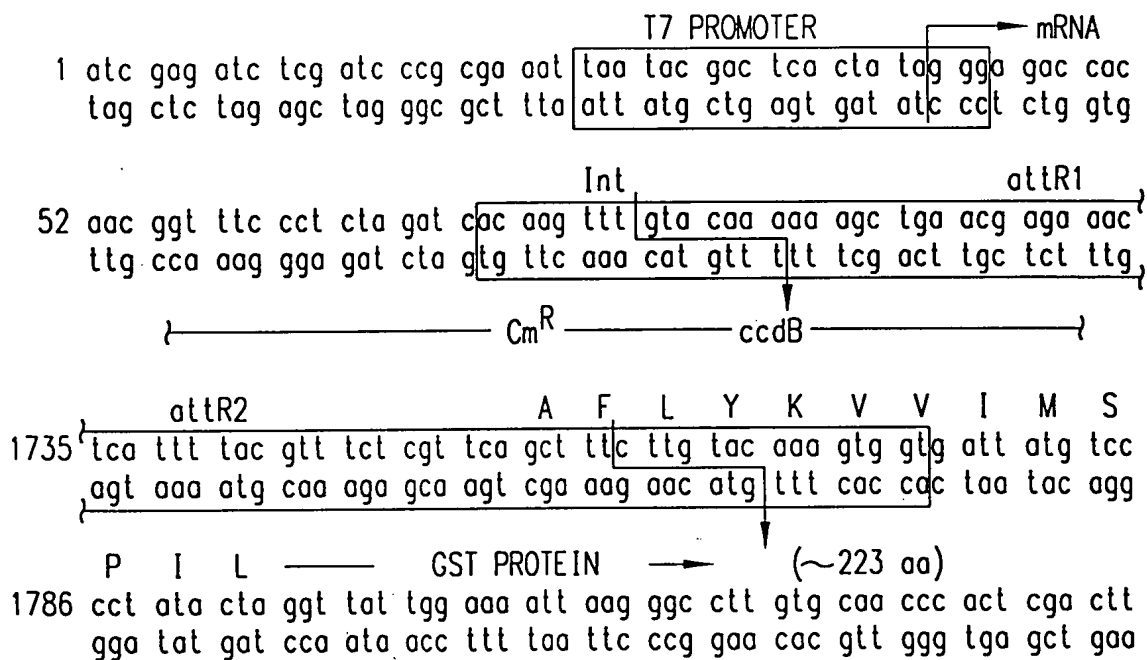


FIG.44A

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pDEST24 6961 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
195..71	attR1
304..963	CmR
1083..1167	inactivated ccdA
1305..1610	ccdB
1651..1775	attR2
1783..2451	GST
3181..4041	ampR
4190..4829	ori

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1 ATCGAGATCT CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC
61 CCTCTAGATC ACAAGTTTGT AAAAAAAGC TGAACGAGAA ACGTAAAATG ATATAAATAT
121 CAATATATTA AATTAGATTT TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA
181 TATCCAGTCA CTATGGCGGC CGCATTAGGC ACCCCAGGCT TTACACTTTA TGCTTCCGGC
241 TCGTATAATG TGTGGATTTT GAGTTAGGAT CCGGCGAGAT TTTCAGGAGC TAAGGAAGCT
301 AAAATGGAGA AAAAAATCAC TGGATATACC ACCGTTGATA TATCCCAATG GCATCGTAAA
361 GAACATTTTG AGGCATTTCA GTCAGTTGCT CAATGTACCT ATAACCAGAC CGTTCAGCTG
421 GATATTACGG CCTTTTTAAA GACCGTAAAG AAAAATAAGC ACAAGTTTTA TCCGGCCTTT
481 ATTCACATTC TTGCCCGCCT GATGAATGCT CATCCGGAAT TCCGTATGGC AATGAAAGAC
541 GGTGAGCTGG TGATATGGGA TAGTGTTTAC CCTTGTTACA CCGTTTTCCA TGAGCAAAC
601 GAAACGTTTT CATCGCTCTG GAGTGAATAC CACGACGATT TCCGGCAGTT TCTACACATA
661 TATTCGCAAG ATGTGGCGTG TTACGGTGAA AACCTGGCCT ATTTCCCTAA AGGGTTTATT
721 GAGAATATGT TTTTCGTCTC AGCCAATCCC TGGGTGAGTT TCACCAGTTT TGATTTAAAC
781 GTGGCCAATA TGGACAACTT CTTGCCCCC GTTTTCACCA TGGGCAAATA TTATACGCAA
841 GGCACAAAGG TGCTGATGCC GCTGGCGATT CAGGTTTCATC ATGCCGTCTG TGATGGCTTC
901 CATGTCGGCA GAATGCTTAA TGAATTACAA CAGTACTGCG ATGAGTGGCA GGGCGGGGCG
961 TAAACGCGTG GATCCGGCTT ACTAAAAGCC AGATAACAGT ATGCGTATTT GCGCGCTGAT
1021 TTTTGCGGTA TAAGAATATA TACTGATATG TATACCCGAA GTATGTCAAA AAGAGGTGTG
1081 CTATGAAGCA GCGTATTACA GTGACAGTTG ACAGCGACAG CTATCAGTTG CTCAAGGCAT
1141 ATATGATGTC AATATCTCCG GTCTGGTAAG CACAACCATG CAGAATGAAG CCCGTCGTCT
1201 GCGTGCCGAA CGCTGGAAAG CGGAAAATCA GGAAGGGATG GCTGAGGTCG CCCGGTTTAT
1261 TGAAATGAAC GGCTCTTTTG CTGACGAGAA CAGGGACTGG TGAAATGCAG TTTAAGGTTT
1321 ACACCTATAA AAGAGAGAGC CGTTATCGTC TGTTTGTGGA TGTACAGAGT GATATTATTG
1381 ACACGCCCGG GCGACGGATG GTGATCCCC TGGCCAGTGC ACGTCTGCTG TCAGATAAAG
1441 TCTCCCGTGA ACTTTACCCG GTGGTGCATA TCGGGGATGA AAGCTGGCGC ATGATGACCA
1501 CCGATATGGC CAGTGTGCCG GTCTCCGTTA TCGGGGAAGA AGTGGCTGAT CTCAGCCACC
1561 GCGAAAATGA CATCAAAAAC GCCATTAACC TGATGTTCTG GGGAATATAA ATGTCAGGCT
1621 CCCTTATACA CAGCCAGTCT GCAGGTCGAC CATAGTGACT GGATATGTTG TGTTTTACAG
1681 TATTATGTAG TCTGTTTTTT ATGCAAAATC TAATTTAATA TATTGATATT TATATCATTT
1741 TACGTTTCTC GTTCAGCTTT CTTGTACAAA GTGGTGATTA TGCCCCCTAT ACTAGGTTAT
1801 TGGAAAATTA AGGGCCTTGT GCAACCCACT CGACTTCTTT TGGAATATCT TGAAGAAAAA
1861 TATGAAGAGC ATTTGTATGA GCGCGATGAA GGTGATAAAT GGCGAAACAA AAAGTTTGAA
1921 TTGGGTTTGG AGTTTCCCAA TCTTCCTTAT TATATTGATG GTGATGTTAA ATTAACACAG

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FIG.44B

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1981 TCTATGGCCA TCATACGTTA TATAGCTGAC AAGCACAACA TGTTGGGTGG TTGTCCAAAA
2041 GAGCGTGCAG AGATTTCAAT GCTTGAAGGA GCGGTTTTGG ATATTAGATA CCGTGTTTCG
2101 AGAATTGCAT ATAGTAAAGA CTTTGAAACT CTCAAAGTTG ATTTTCTTAG CAAGCTACCT
2161 GAAATGCTGA AAATGTTCTGA AGATCGTTTA TGTCATAAAA CATATTTAAA TGGTGATCAT
2221 GTAACCCATC CTGACTTCAT GTTGTATGAC GCTCTTGATG TTGTTTTATA CATGGACCCA
2281 ATGTGCCTGG ATGCGTTCCT AAAATTAGTT TGTTTTAAAA AACGTATTGA AGCTATCCCA
2341 CAAATTGATA AGTACTTGAA ATCCAGCAAG TATATAGCAT GGCCTTTGCA GGGCTGGCAA
2401 GCCACGTTTG GTGGTGGCGA CCATCCTCCA AAATCGGATC TGGTTCCGCG TCCATGGGGA
2461 TCCGGCTGCT AACAAAGCCC GAAAGGAAGC TGAGTTGGCT GCTGCCACCG CTGAGCAATA
2521 ACTAGCATAA CCCCTTGGGG CCTCTAAACG GGTCTTGAGG GGTTTTTTCG TGAAAGGAGG
2581 AACTATATCC GGATATCCAC AGGACGGGTG TGGTCGCCAT GATCGCGTAG TCGATAGTGG
2641 CTCCAAGTAG CGAAGCGAGC AGGACTGGGC GCGGGCCAAA GCGGTGCGAC AGTGCTCCGA
2701 GAACGGGTGC GCATAGAAAT TGCATCAACG CATATAGCGC TAGCAGCACG CCATAGTGAC
2761 TGGCGATGCT GTCGGAATGG ACGATATCCC GCAAGAGGCC CGGCAGTACC GGCATAACCA
2821 AGCCTATGCC TACAGCATCC AGGGTGACGG TGCCGAGGAT GACGATGAGC GCATTGTTAG
2881 ATTTCATACA CGGTGCCTGA CTGCGTTAGC AATTTAACTG TGATAAACTA CCGCATTAAA
2941 GCTTATCGAT GATAAGCTGT CAAACATGAG AATTCTTGAA GACGAAAGGG CCTCGTGATA
3001 CGCCTATTTT TATAGGTTAA TGTCATGATA ATAATGGTTT CTTAGACGTC AGGTGGCACT
3061 TTTCTGGGAA ATGTGCGCGG AACCCCTATT TGTTTATTTT TCTAAATACA TTCAAATATG
3121 TATCCGCTCA TGAGACAATA ACCCTGATAA ATGCTTCAAT AATATTGAAA AAGGAAGAGT
3181 ATGAGTATTC AACATTTCCG TGTCGCCCTT ATTCCCTTTT TTGCGGCATT TTGCCTTCCT
3241 GTTTTTGCTC ACCCAGAAAC GCTGGTGAAA GTAAAAGATG CTGAAGATCA GTTGGGTGCA
3301 CGAGTGGGTT ACATCGAACT GGATCTCAAC AGCGGTAAGA TCCTTGAGAG TTTTCGCCCC
3361 GAAGAACGTT TTCCAATGAT GAGCACTTTT AAAGTTCTGC TATGTGGCGC GGTATTATCC
3421 CGTGTGACG CCGGGCAAGA GCAACTCGGT CGCCGCATAC ACTATTCTCA GAATGACTTG
3481 GTTGAGTACT CACCAGTCAC AGAAAAGCAT CTTACGGATG GCATGACAGT AAGAGAATTA
3541 TGCAGTGCTG CCATAACCAT GAGTGATAAC ACTGCGGCCA ACTTACTTCT GACAACGATC
3601 GGAGGACCGA AGGAGCTAAC CGCTTTTTTG CACAACATGG GGGATCATGT AACTCGCCTT
3661 GATCGTTGGG AACCGGAGCT GAATGAAGCC ATACCAAACG ACGAGCGTGA CACCACGATG
3721 CCTGCAGCAA TGGCAACAAC GTTGCGCAAA CTATTAAGTG GCGAACTACT TACTCTAGCT
3781 TCCCGGCAAC AATTAATAGA CTGGATGGAG GCGGATAAAG TTGCAGGACC ACTTCTGCGC
3841 TCGGCCCTTC CGGCTGGCTG GTTTATTGCT GATAAATCTG GAGCCGGTGA GCGTGGGTCT
3901 CGCGGTATCA TTGCAGCACT GGGGCCAGAT GGTAAGCCCT CCCGTATCGT AGTTATCTAC
3961 ACGACGGGGA GTCAGGCAAC TATGGATGAA CGAAATAGAC AGATCGCTGA GATAGGTGCC
4021 TCACTGATTA AGCATTGGTA ACTGTCAGAC CAAGTTTACT CATATATACT TTAGATTGAT
4081 TTA AAACTTC ATTTTAAATT TAAAAGGATC TAGGTGAAGA TCCTTTTTGA TAATCTCATG
4141 ACCAAAATCC CTTAACGTGA GTTTTCGTTT CACTGAGCGT CAGACCCCGT AGAAAAGATC
4201 AAAGGATCTT CTTGAGATCC TTTTTTCTG CGCGTAATCT GCTGCTTGCA AACAAAAAAA
4261 CCACCGCTAC CAGCGGTGGT TTGTTTGCCG GATCAAGAGC TACCAACTCT TTTTCCGAAG
4321 GTAACCTGGT TCAGCAGAGC GCAGATACCA AATACTGTCC TTCTAGTGTA GCCGTAGTTA
4381 GGCCACCACT TCAAGAACTC TGTAGCACCG CCTACATACC TCGCTCTGCT AATCCTGTTA
4441 CCACTGGCTG CTGCCAGTGG CGATAAGTCG TGTCTTACCG GGTGGAAGTC AAGACGATAG
4501 TTACCGGATA AGGCGCAGCG GTCGGGCTGA ACGGGGGGTT CGTGACACAC GCCCAGCTTG
4561 GAGCGAACGA CCTACACCGA ACTGAGATAC CTACAGCGTG AGCTATGAGA AAGCGCCACG
4621 CTTCCCGAAG GGAGAAAGGC GGACAGGTAT CCGGTAAGCG GCAGGGTCGG AACAGGAGAG
4681 CGCACGAGGG AGCTTCCAGG GGGAAACGCC TGGTATCTTT ATAGTCCTGT CGGGTTTCGC

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FIG.44C

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4741 CACCTCTGAC TTGAGCGTCG ATTTTGTGA TGCTCGTCAG GGGGGCGGAG CCTATGGAAA
4801 AACGCCAGCA ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT TGCTCACATG
4861 TTCTTTCCTG CGTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCCTT TGAGTGAGCT
4921 GATACCGCTC GCCGCAGCCG AACGACCGAG CGCAGCGAGT CAGTGAGCGA GGAAGCGGAA
4981 GAGCGCCTGA TGCGGTATTT TCTCCTTACG CATCTGTGCG GTATTTCACA CCGCATATAT
5041 GGTGCACTCT CAGTACAATC TGCTCTGATG CCGCATAGTT AAGCCAGTAT ACACTCCGCT
5101 ATCGCTACGT GACTGGGTCA TGGCTGCGCC CCGACACCCG CCAACACCCG CTGACGCGCC
5161 CTGACGGGCT TGTCTGCTCC CGGCATCCGC TTACAGACAA GCTGTGACCG TCTCCGGGAG
5221 CTGCATGTGT CAGAGGTTTT CACCGTCATC ACCGAAACGC GCGAGGCAGC TGCGGTAAAG
5281 CTCATCAGCG TGGTCGTGAA GCGATTCACA GATGTCTGCC GTTTCATCCG CGTCCAGCTC
5341 GTTGAGTTTC TCCAGAAGCG TTAATGTCTG GCTTCTGATA AAGCGGGCCA TGTTAAGGGC
5401 GGTTTTTTCC TGTTTGGTCA CTGATGCCTC CGTGTAAGGG GGATTTCTGT TCATGGGGGT
5461 AATGATACCG ATGAAACGAG AGAGGATGCT CACGATACGG GTTACTGATG ATGAACATGC
5521 CCGGTTACTG GAACGTTGTG AGGGTAAACA ACTGGCGGTA TGGATGCGGC GGGACCAGAG
5581 AAAAATCACT CAGGGTCAAT GCCAGCGCTT CGTTAATACA GATGTAGGTG TTCCACAGGG
5641 TAGCCAGCAG CATCCTGCGA TGCAGATCCG GAACATAATG GTGCAGGGCG CTGACTTCCG
5701 CGTTTCCAGA CTTTACGAAA CACGGAAACC GAAGACCATT CATGTTGTTG CTCAGGTCGC
5761 AGACGTTTTG CAGCAGCAGT CGCTTCACGT TCGCTCGCGT ATCGGTGATT CATTCTGCTA
5821 ACCAGTAAGG CAACCCCGCC AGCCTAGCCG GGTCTCAAC GACAGGAGCA CGATCATGCG
5881 CACCCGTGGC CAGGACCCAA CGCTGCCCGA GATGCGCCGC GTGCGGCTGC TGGAGATGGC
5941 GGACGCGATG GATATGTTCT GCCAAGGGTT GGTGCGCA TTCACAGTTC TCCGCAAGAA
6001 TTGATTGGCT CCAATTCTTG GAGTGGTGAA TCCGTTAGCG AGGTGCCGCC GGCTTCCATT
6061 CAGGTCGAGG TGGCCCGGCT CCATGCACCG CGACGCAACG CGGGGAGGCA GACAAGGTAT
6121 AGGGCGGCGC CTACAATCCA TGCCAACCCG TTCCATGTGC TCGCCGAGGC GGCATAAATC
6181 GCCGTGACGA TCAGCGGTCC AGTGATCGAA GTTAGGCTGG TAAGAGCCGC GAGCGATCCT
6241 TGAAGCTGTC CCTGATGGTC GTCATCTACC TGCCTGGACA GCATGGCCTG CAACGCGGGC
6301 ATCCCGATGC CGCCGGAAGC GAGAAGAATC ATAATGGGGA AGGCCATCCA GCCTCGCGTC
6361 GCGAACGCCA GCAAGACGTA GCCCAGCGCG TCGGCCGCCA TGCCGGCGAT AATGGCCTGC
6421 TTCTCGCCGA AACGTTTGGT GGCGGGACCA GTGACGAAGG CTTGAGCGAG GGCCTGCAAG
6481 ATTCCGAATA CCGCAAGCGA CAGGCCGATC ATCGTCGCGC TCCAGCGAAA GCGGTCCTCG
6541 CCGAAAATGA CCCAGAGCGC TGCCGGCACC TGTCTACGA GTTGATGAT AAAGAAGACA
6601 GTCATAAGTG CGGCGACGAT AGTCATGCCC CGCGCCACC GGAAGGAGCT GACTGGGTTG
6661 AAGGCTCTCA AGGGCATCGG TCGATCGACG CTCTCCCTTA TGCGACTCCT GCATTAGGAA
6721 GCAGCCAGT AGTAGGTTGA GGCCGTTGAG CACCGCCGCC GCAAGGAATG GTGCATGCAA
6781 GGAGATGGCG CCAACAGTC CCCCAGCCAC GGGGCGTCC ACCATACCA CGCCGAAACA
6841 AGCGCTCATG AGCCGAAGT GGCAGCCCG ATCTTCCCA TCGGTGATGT CGGCGATATA
6901 GGCGCCAGCA ACCGCACCTG TGGCGCCGGT GATGCCGGCC ACGATGCGTC CGGCGTAGAG
6961 G
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FIG.44D

THIOREDOXIN CARBOXY-FUSION VECTOR, T7 PROMOTER

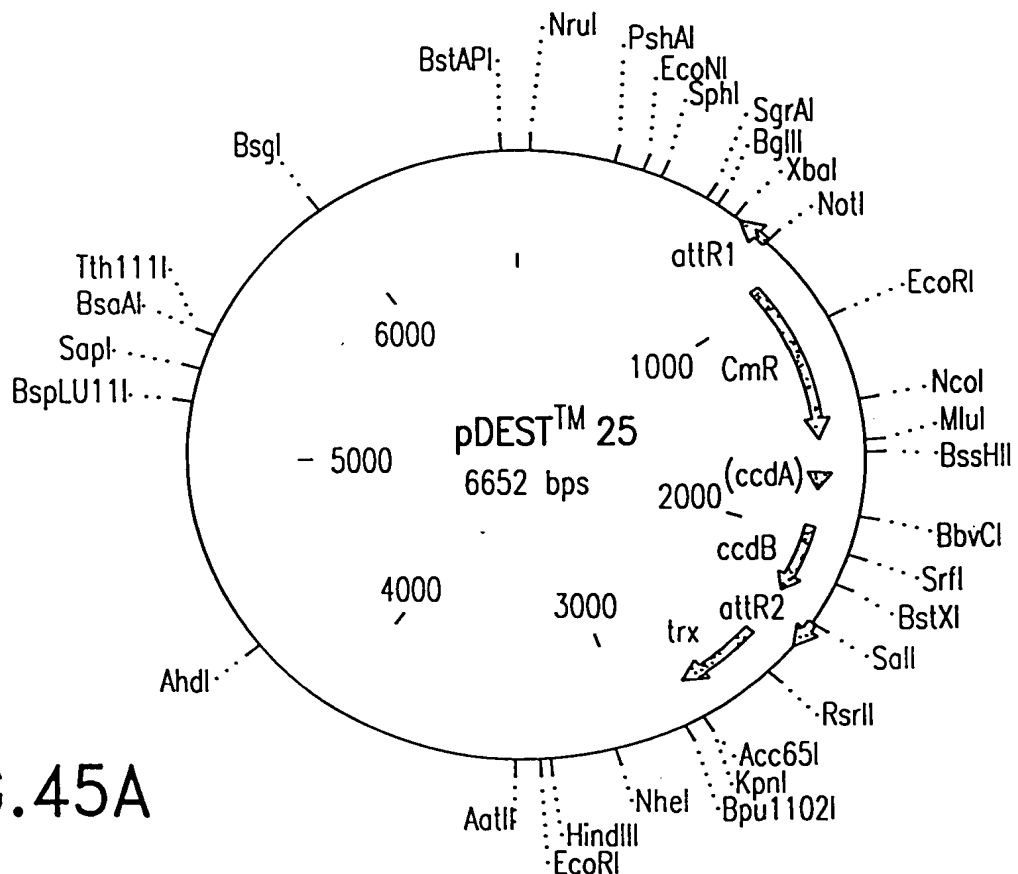


FIG. 45A

139/253

pDEST25 6652 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
844..720	attR1
953..1612	CmR
1732..1816	inactivated ccdA
1954..2259	ccdB
2300..2424	attR2
2432..2794	trx

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1  CCGGAAGCGA GAAGAATCAT AATGGGGAAG GCCATCCAGC CTCGCGTCGC GAACGCCAGC
61 AAGACGTAGC CCAGCGCGTC GGCCGCCATG CCGGCGATAA TGGCCTGCTT CTCGCCGAAA
121 CGTTTGGTGG CGGGACCACT GACGAAGGCT TGAGCGAGGG CGTGCAAGAT TCCGAATACC
181 GCAAGCGACA GGCCGATCAT CGTCGCGCTC CAGCGAAAGC GGTCCTCGCC GAAAATGACC
241 CAGAGCGCTG CCGGCACCTG TCCTACGAGT TGCATGATAA AGAAGACAGT CATAAGTGCG
301 GCGACGATAG TCATGCCCCG CGCCACCGG AAGGAGCTGA CTGGGTTGAA GGCTCTCAAG
361 GGCATCGGTC GATCGACGCT CTCCCTTATG CGACTCCTGC ATTAGGAAGC AGCCCAGTAG
421 TAGGTTGAGG CCGTTGAGCA CCGCCGCCGC AAGGAATGGT GCATGCAAGG AGATGGCGCC
481 CAACAGTCCC CCGGCCACGG GGCCTGCCAC CATACCCACG CCGAAACAAG CGCTCATGAG
541 CCCGAAGTGG CGAGCCCGAT CTTCCCATC GGTGATGTCG GCGATATAGG CGCCAGCAAC
601 CGCACCTGTG GCGCCGGTGA TGCCGGCCAC GATGCGTCCG GCGTAGAGGA TCGAGATCTC
661 GATCCCGCGA AATTAATACG ACTCACTATA GGGAGACCAC AACGGTTTCC CTCTAGATCA
721 CAAGTTTGTA CAAAAAAGCT GAACGAGAAA CGTAAAATGA TATAAATATC AATATATTAA
781 ATTAGATTTT GCATAAAAAA CAGACTACAT AATACTGTAA AACACAACAT ATCCAGTCAC
841 TATGGCGGCC GCATTAGGCA CCCAGGCTT TACACTTTAT GCTTCCGGCT CGTATAATGT
901 GTGGATTTTG AGTTAGGATC CGGCGAGATT TTCAGGAGCT AAGGAAGCTA AAATGGAGAA
961 AAAAATCACT GGATATACCA CCGTTGATAT ATCCCAATGG CATCGTAAAG AACATTTTGA
1021 GGCATTTTCA TCAGTTGCTC AATGTACCTA TAACCAGACC GTTCAGCTGG ATATTACGGC
1081 CTTTTTAAAG ACCGTAAAGA AAAATAAGCA CAAGTTTTAT CCGGCCTTTA TTCACATTCT
1141 TGCCCGCCTG ATGAATGCTC ATCCGGAATT CCGTATGGCA ATGAAAGACG GTGAGCTGGT
1201 GATATGGGAT AGTGTTCACT CTTGTTACAC CGTTTTCCAT GAGCAAACCTG AAACGTTTTTC
1261 ATCGCTCTGG AGTGAATACC ACGACGATTT CCGGCAGTTT CTACACATAT ATTCGCAAGA
1321 TGTGGCGTGT TACGGTGAAA ACCTGGCCTA TTTCCCTAAA GGGTTTATTG AGAATATGTT
1381 TTTCGTCTCA GCCAATCCCT GGGTGAGTTT CACCAGTTT GATTTAAACG TGGCCAATAT
1441 GGACAACTTC TTCGCCCCCG TTTTCACCAT GGGCAAATAT TATACGCAAG GCGACAAGGT
1501 GCTGATGCCG CTGGCGATTC AGGTTTCATCA TGCCGTCTGT GATGGCTTCC ATGTCGGCAG
1561 AATGCTTAAT GAATTACAAC AGTACTGCGA TGAGTGCCAG GCGGGGGCGT AAACGCGTGG
1621 ATCCGGCTTA CTAAGAGCCA GATAACAGTA TGCATTTTGG CGCGCTGATT TTTGCGGTAT
1681 AAGAATATAT ACTGATATGT ATACCCGAAG TATGTCAAAA AGAGGTGTGC TATGAAGCAG
1741 CGTATTACAG TGACAGTTGA CAGCGACAGC TATCAGTTGC TCAAGGCATA TATGATGTCA
1801 ATATCTCCGG TCTGGTAAGC ACAACCATGC AGAATGAAGC CCGTCGTCTG CGTGCCGAAC
1861 GCTGGAAAGC GGAAAATCAG GAAGGGATGG CTGAGGTCGC CCGGTTTATT GAAATGAACG
1921 GCTCTTTTGC TGACGAGAAC AGGGACTGGT GAAATGCAGT TTAAGGTTTA CACCTATAAA
1981 AGAGAGAGCC GTTATCGTCT GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCGGG
2041 CGACGGATGG TGATCCCCCT GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA

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FIG.45B

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2101	CTTTACCCGG	TGGTGCATAT	CGGGGATGAA	AGCTGGCGCA	TGATGACCAC	CGATATGGCC
2161	AGTGTGCCGG	TCTCCGTTAT	CGGGGAAGAA	GTGGCTGATC	TCAGCCACCG	CGAAAATGAC
2221	ATCAAAAACG	CCATTAACCT	GATGTTCTGG	GGAATATAAA	TGTCAGGCTC	CCTTATACAC
2281	AGCCAGTCTG	CAGGTCGACC	ATAGTGACTG	GATATGTTGT	GTTTTACAGT	ATTATGTAGT
2341	CTGTTTTTTA	TGCAAAATCT	AATTTAATAT	ATTGATATTT	ATATCATTTT	ACGTTTCTCG
2401	TTCAGCTTTC	TTGTACAAAG	TGGTGATTAT	GAGCGATAAA	ATTATTCACC	TGACTGACGA
2461	CAGTTTTTGAC	ACGGATGTAC	TCAAAGCGGA	CGGGGCGATC	CTCGTCGATT	TCTGGGCAGA
2521	GTGGTGCGGT	CCGTGCAAAA	TGATCGCCCC	GATTCTGGAT	GAAATCGCTG	ACGAATATCA
2581	GGGCAAACTG	ACCGTTGCAA	AACTGAACAT	CGATCAAAAC	CCTGGCACTG	CGCCGAAATA
2641	TGGCATCCGT	GGTATCCCGA	CTCTGCTGCT	GTTCAAAAAC	GGTGAAGTGG	CGGCAACCAA
2701	AGTGGGTGCA	CTGTCTAAAG	GTCAGTTGAA	AGAGTTCCTC	GACGCTAACC	TGGCCGGTTC
2761	TGGTTCCTGGT	GATGACGATG	ACAAGGTACC	CGGGGATCGA	TCCGGCTGCT	AACAAAGCCC
2821	GAAAGGAAGC	TGAGTTGGCT	GCTGCCACCG	CTGAGCAATA	ACTAGCATAA	CCCCTTGGGG
2881	CCTCTAAACG	GGTCTTGAGG	GGTTTTTTGC	TGAAAGGAGG	AACTATATCC	GGATATCCAC
2941	AGGACGGGTG	TGGTCGCCAT	GATCGCGTAG	TCGATAGTGG	CTCCAAGTAG	CGAAGCGAGC
3001	AGGACTGGGC	GGCGGCCAAA	GCGGTCCGAC	AGTGCTCCGA	GAACGGGTGC	GCATAGAAAT
3061	TGCATCAACG	CATATAGCGC	TAGCAGCACG	CCATAGTGAC	TGGCGATGCT	GTCGGAATGG
3121	ACGATATCCC	GCAAGAGGCC	CGGCAGTACC	GGCATAACCA	AGCCTATGCC	TACAGCATCC
3181	AGGGTGACGG	TGCCGAGGAT	GACGATGAGC	GCATTGTTAG	ATTTCATACA	CGGTGCCTGA
3241	CTGCGTTAGC	AATTTAACTG	TGATAAACTA	CCGCATTAAA	GCTTATCGAT	GATAAGCTGT
3301	CAAACATGAG	AATTCTTGAA	GACGAAAGGG	CCTCGTGATA	CGCCTATTTT	TATAGGTTAA
3361	TGTCATGATA	ATAATGGTTT	CTTAGACGTC	AGGTGGCACT	TTTCGGGGAA	ATGTGCGCGG
3421	AACCCCTATT	TGTTTTATTT	TCTAAATACA	TTCAAATATG	TATCCGCTCA	TGAGACAATA
3481	ACCTGATAA	ATGCTTCAAT	AATATTGAAA	AAGGAAGAGT	ATGAGTATTC	AACATTTCCG
3541	TGTCGCCCTT	ATTCCCTTTT	TTGCGGCATT	TTGCCTTCCT	GTTTTTGCTC	ACCCAGAAAC
3601	GCTGGTGAAA	GTAAAAGATG	CTGAAGATCA	GTTGGGTGCA	CGAGTGGGT	ACATCGAACT
3661	GGATCTCAAC	AGCGGTAAGA	TCCTTGAGAG	TTTTCGCCCC	GAAGAACGTT	TTCCAATGAT
3721	GAGCACTTTT	AAAGTTCTGC	TATGTGGCGC	GGTATTATCC	CGTGTGACG	CCGGGCAAGA
3781	GCAACTCGGT	CGCCGCATAC	ACTATTCTCA	GAATGACTTG	GTTGAGTACT	CACCAGTCAC
3841	AGAAAAGCAT	CTTACGGATG	GCATGACAGT	AAGAGAATTA	TGCAGTGCTG	CCATAACCAT
3901	GAGTGATAAC	ACTGCGGCCA	ACTTACTTCT	GACAACGATC	GGAGGACCGA	AGGAGCTAAC
3961	CGCTTTTTTG	CACAACATGG	GGGATCATGT	AACTCGCCTT	GATCGTTGGG	AACCGGAGCT
4021	GAATGAAGCC	ATACCAAACG	ACGAGCGTGA	CACCACGATG	CCTGCAGCAA	TGGCAACAAC
4081	GTTGCGCAAA	CTATTAACCT	GCGAACTACT	TACTCTAGCT	TCCCGGCAAC	AATTAATAGA
4141	CTGGATGGAG	GCGGATAAAG	TTGCAGGACC	ACTTCTGCGC	TGCGCCCTTC	CGGCTGGCTG
4201	GTTTATTGCT	GATAAATCTG	GAGCCGGTGA	GCGTGGGTCT	CGCGGTATCA	TTGCAGCACT
4261	GGGGCCAGAT	GGTAAGCCCT	CCCGTATCGT	AGTTATCTAC	ACGACGGGGA	GTCAGGCAAC
4321	TATGGATGAA	CGAAATAGAC	AGATCGCTGA	GATAGGTGCC	TCACTGATTA	AGCATTGGTA
4381	ACTGTCAGAC	CAAGTTTACT	CATATATACT	TTAGATTGAT	TTAAAACTTC	ATTTTTAATT
4441	TAAAAGGATC	TAGGTGAAGA	TCCTTTTTGA	TAATCTCATG	ACCAAAATCC	CTTAACGTGA
4501	GTTTTTCGTT	CACTGAGCGT	CAGACCCCGT	AGAAAAGATC	AAAGGATCTT	CTTGAGATCC
4561	TTTTTTTCTG	CGCGTAATCT	GCTGCTTGCA	AACAAAAAAA	CCACCGCTAC	CAGCGGTGGT
4621	TTGTTTGCCG	GATCAAGAGC	TACCAACTCT	TTTTCCGAAG	GTAAGTGGCT	TCAGCAGAGC
4681	GCAGATACCA	AATACTGTCC	TTCTAGTGTA	GCCGTAGTTA	GGCCACCACT	TCAAGAACTC
4741	TGTAGCACCG	CCTACATACC	TCGCTCTGCT	AATCCTGTTA	CCAGTGCGCTG	CTGCCAGTGG
4801	CGATAAGTCG	TGTCTTACCG	GGTTGGACTC	AAGACGATAG	TTACCGGATA	AGGCGCAGCG

FIG.45C

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4861 GTCGGGCTGA ACGGGGGGTT CGTGACACACA GCCCAGCTTG GAGCGAACGA CCTACACCGA
4921 ACTGAGATAC CTACAGCGTG AGCTATGAGA AAGCGCCACG CTTCCCGAAG GGAGAAAGGC
4981 GGACAGGTAT CCGGTAAGCG GCAGGGTCGG AACAGGAGAG CGCACGAGGG AGCTTCCAGG
5041 GGGAAACGCC TGGTATCTTT ATAGTCCTGT CGGGTTTCGC CACCTCTGAC TTGAGCGTCG
5101 ATTTTTGTGA TGCTCGTCAG GGGGGCGGAG CCTATGGAAA AACGCCAGCA ACGCGGCCTT
5161 TTTACGGTTC CTGGCCTTTT GCTGGCCTTT TGCTCACATG TTCTTTCCTG CGTTATCCCC
5221 TGATTCTGTG GATAACCGTA TTACCGCCTT TGAGTGAGCT GATACCGCTC GCCGCAGCCG
5281 AACGACCGAG CGCAGCGAGT CAGTGAGCGA GGAAGCGGAA GAGCGCCTGA TGCGGTATTT
5341 TCTCCTTACG CATCTGTGCG GTATTTTACA CCGCATATAT GGTGCACTCT CAGTACAATC
5401 TGCTCTGATG CCGCATAGTT AAGCCAGTAT ACACTCCGCT ATCGCTACGT GACTGGGTCA
5461 TGGCTGCGCC CCGACACCCG CCAACACCCG CTGACGCGCC CTGACGGGCT TGTCTGCTCC
5521 CGGCATCCGC TTACAGACAA GCTGTGACCG TCTCCGGGAG CTGCATGTGT CAGAGGTTTT
5581 CACCGTCATC ACCGAAACGC GCGAGGCAGC TGCGGTAAAG CTCATCAGCG TGGTCGTGAA
5641 GCGATTACAA GATGTCTGCC TGTTTCATCCG CGTCCAGCTC GTTGAGTTTC TCCAGAAGCG
5701 TTAATGTCTG GCTTCTGATA AAGCGGGCCA TGTTAAGGGC GGTTTTTTTCC TGTTTGGTCA
5761 CTGATGCCTC CGTGTAAGGG GGATTTCTGT TCATGGGGGT AATGATACCG ATGAAACGAG
5821 AGAGGATGCT CACGATACGG GTTACTGATG ATGAACATGC CCGGTTACTG GAACGTTGTG
5881 AGGGTAAACA ACTGGCGGTA TGGATGCGGC GGGACCAGAG AAAAATCACT CAGGGTCAAT
5941 GCCAGCGCTT CGTTAATACA GATGTAGGTG TTCCACAGGG TAGCCAGCAG CATCCTGCGA
6001 TGCAGATCCG GAACATAATG GTGCAGGGCG CTGACTTCCG CGTTTCCAGA CTTTACGAAA
6061 CACGGAAACC GAAGACCATT CATGTTGTTG CTCAGGTCGC AGACGTTTTG CAGCAGCAGT
6121 CGCTTCACGT TCGCTCGCGT ATCGGTGATT CATTCTGCTA ACCAGTAAGG CAACCCCGCC
6181 AGCCTAGCCG GGTCTCAAC GACAGGAGCA CGATCATGCG CACCCGTGGC CAGGACCCAA
6241 CGCTGCCCGA GATGCGCCGC GTGCGGCTGC TGGAGATGGC GGACGCGATG GATATGTTCT
6301 GCCAAGGGTT GGTTCGCGCA TTCACAGTTC TCCGCAAGAA TTGATTGGCT CCAATTCTTG
6361 GAGTGGTGAA TCCGTTAGCG AGGTGCCGCC GGCTTCCATT CAGGTCGAGG TGGCCCGGCT
6421 CCATGCACCG CGACGCAACG CGGGGAGGCA GACAAGGTAT AGGGCGGCGC CTACAATCCA
6481 TGCCAACCCG TTCCATGTGC TCGCCGAGGC GGCATAAATC GCCGTGACGA TCAGCGGTCC
6541 AGTGATCGAA GTTAGGCTGG TAAGAGCCGC GAGCGATCCT TGAAGCTGTC CCTGATGGTC
6601 GTCATCTACC TGCCTGGACA GCATGGCCTG CAACGCGGGC ATCCCGATGC CG

FIG.45D

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pDEST26 His6 AMINO FUSION IN pCMV Sport-neo VECTOR

600 ttg acg tca atg gga gtt tgt ttt ggc acc aaa ctc aac ggg act ttc caa
aac tgc agt tac cct caa aca aaa ccg tgg ttt tag ttg ccc tga aag gtt

651 aat gtc gta aca act ccg ccc cat tga cgc aaa tgg gcg gta ggc gtg tac
tta cag cat tgt tga ggc ggg gla act gcg ttt acc cgc cat ccg cac atg

702 ggg ggg agg tct ata taa gca gag ctc gtt tag tga acc gtc aga tgc cct
cca ccc tcc aga tat att cgt ctc gag caa atc act tgg cag tct agc gga

753 gga gac gcc atc cac gct gtt ttg acc tcc ata gaa gac acc ggg acc gat
cct ctg cgg tag gtg cga caa aac tgg agg tat ctt ctg tgg ccc tgg cto

804 cca gcc tcc gga ctc tag cct agg ccg cgg acc atg gcg tac tac cat cac
ggt cgg agg cct gag atc gga tcc ggc gcc tgg tac cgc atg atg gta gtg

855 cat cac cat cac tct aga tca aca agt ttg tac aaa aaa gct gaa cga gaa
gta gtg gta gtg aga tct agt tgt tca aac atg ttt ttt cga ctt gct ctt

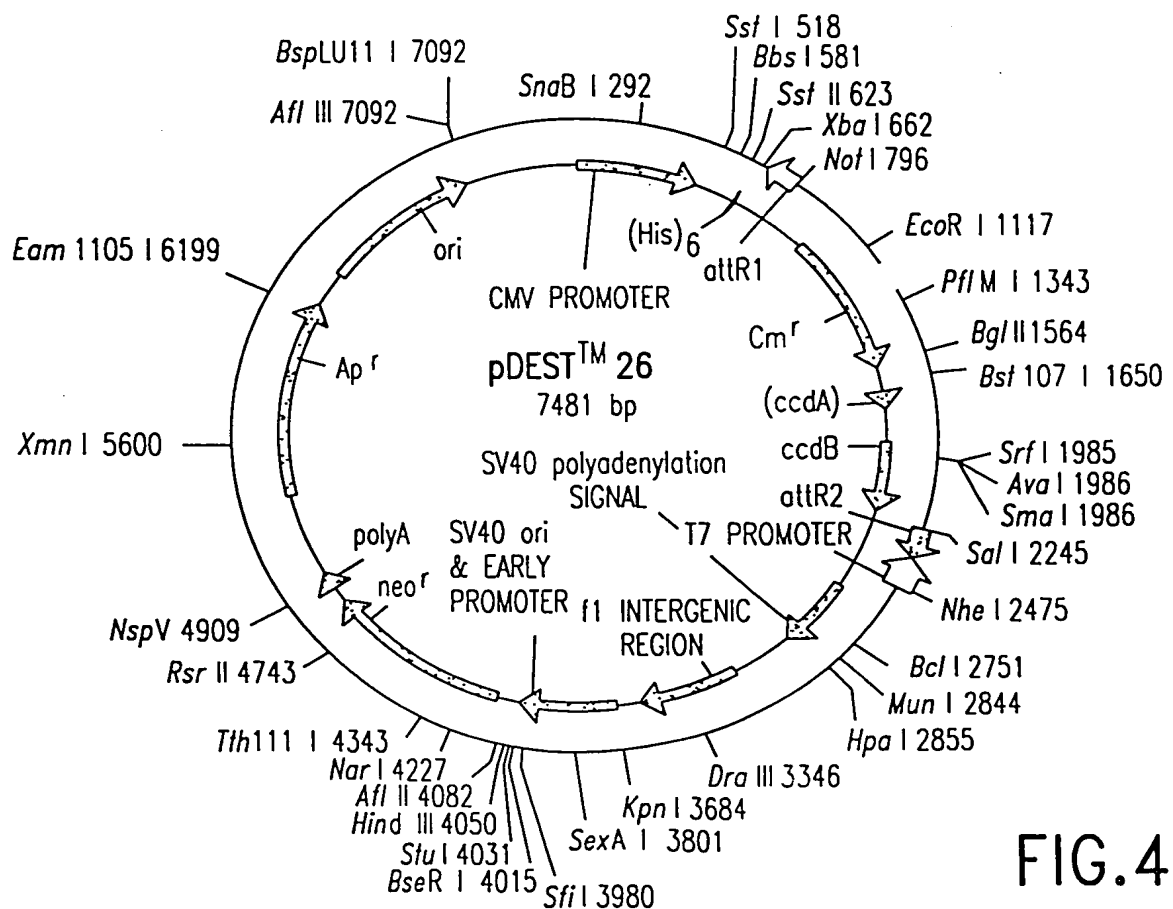


FIG.46A

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pDEST26 7481 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
492..509	his6
619..519	attR1
752..1411	CmR
1531..1615	inactivated ccdA
1753..2058	ccdB
2099..2223	attR2
2409..2771	SV40 polyA
2966..3421	f1 intergenic region
3485..3903	SV40 promoter
3948..4742	neo
4806..4854	polyA
5265..6125	Apr
6274..6913	ori
7344..385	CMV promoter

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1  GTAAACTGCC CACTTGGCAG TACATCAAGT GTATCATATG CCAAGTACGC CCCCTATTGA
61 CGTCAATGAC GGTAATGGC CCGCCTGGCA TTATGCCAG TACATGACCT TATGGGACTT
121 TCCTACTTGG CAGTACATCT ACGTATTAGT CATCGCTATT ACCATGGTGA TGCGGTTTTG
181 GCAGTACATC AATGGGCGTG GATAGCGGTT TGACTCACGG GGATTTCCAA GTCTCCACCC
241 CATTGACGTC AATGGGAGTT TGTTTTGGCA CCAAATCAA CGGGACTTTC CAAAATGTCTG
301 TAACAACTCC GCCCATTGA CGCAAATGGG CGGTAGGCGT GTACGGTGGG AGGTCTATAT
361 AAGCAGAGCT CGTTTAGTGA ACCGTCAGAT CGCCTGGAGA CGCCATCCAC GCTGTTTTGA
421 CCTCCATAGA AGACACCGGG ACCGATCCAG CCTCCGGACT CTAGCCTAGG CCGCGGACCA
481 TGGCGTACTA CCATCACCAT CACCATCACT CTAGATCAAC AAGTTTGTAC AAAAAAGCTG
541 AACGAGAAAC GTAAATGAT ATAAATATCA ATATATTAAA TTAGATTTTG CATAAAAAAC
601 AGACTACATA ATACTGTAAA ACACAACATA TCCAGTCACT ATGGCGGCCG CATTAGGCAC
661 CCCAGGCTTT ACACTTTATG CTTCCGGCTC GTATAATGTG TGGATTTTGA GTTAGGATCC
721 GGCGAGATTT TCAGGAGCTA AGGAAGCTAA AATGGAGAAA AAAATCACTG GATATACCAC
781 CGTTGATATA TCCAATGGC ATCGTAAAGA ACATTTTGAG GCATTTCACT CAGTTGCTCA
841 ATGTACCTAT AACCAGACCG TTCAGCTGGA TATTACGGCC TTTTAAAGA CCGTAAAGAA
901 AAATAAGCAC AAGTTTTATC CGGCCTTTAT TCACATTCTT GCCCGCCTGA TGAATGCTCA
961 TCCGGAATTC CGTATGGCAA TGAAAGACGG TGAGCTGGTG ATATGGGATA GTGTTCACCC
1021 TTGTTACACC GTTTTCCATG AGCAAATGA AACGTTTTCA TCGCTCTGGA GTGAATACCA
1081 CGACGATTTT CGGCAGTTTC TACACATATA TTCGCAAGAT GTGGCGTGTT ACGGTGAAAA
1141 CCTGGCCTAT TTCCCTAAAG GGTTTATTGA GAATATGTTT TTCGTCTCAG CCAATCCCTG
1201 GGTGAGTTTC ACCAGTTTTG ATTTAAACGT GGCCAATATG GACAACTTCT TCGCCCCCGT
1261 TTTCACCATG GGCAAATATT ATACGCAAGG CGACAAGGTG CTGATGCCGC TGGCGATTCA
1321 GGTTTCATCAT GCCGTCTGTG ATGGCTTCCA TGTCGGCAGA ATGCTTAATG AATTACAACA
1381 GTAGTGCGAT GAGTGGCAGG GCGGGGCGTA AAGATCTGGA TCCGGCTTAC TAAAAGCCAG
1441 ATAACAGTAT GCGTATTTGC GCGCTGATTT TTGCGGTATA AGAATATATA CTGATATGTA
1501 TACCCGAAGT ATGTCAAAAA GAGGTGTGCT ATGAAGCAGC GTATTACAGT GACAGTTGAC
1561 AGCGACAGCT ATCAGTTGCT CAAGGCATAT ATGATGTCAA TATCTCCGGT CTGGTAAGCA

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FIG.46B

1621	CAACCATGCA	GAATGAAGCC	CGTCGTCTGC	GTGCCGAACG	CTGGAAAGCG	GAAAATCAGG
1681	AAGGGATGGC	TGAGGTCGCC	CGGTTTATTG	AAATGAACGG	CTCTTTTGCT	GACGAGAACA
1741	GGGACTGGTG	AAATGCAGTT	TAAGGTTTAC	ACCTATAAAA	GAGAGAGCCG	TTATCGTCTG
1801	TTTGTGGATG	TACAGAGTGA	TATTATTGAC	ACGCCCAGGC	GACGGATGGT	GATCCCCCTG
1861	GCCAGTGCAC	GTCTGCTGTC	AGATAAAGTC	TCCCGTGAAC	TTTACCCGGT	GGTGCAATATC
1921	GGGGATGAAA	GCTGGCGCAT	GATGACCACC	GATATGGCCA	GTGTGCCGGT	CTCCGTTATC
1981	GGGGAAGAAG	TGGCTGATCT	CAGCCACCGC	GAAAATGACA	TCAAAAACGC	CATTAACCTG
2041	ATGTTCTGGG	GAATATAAAT	GTCAGGCTCC	CTTATACACA	GCCAGTCTGC	AGGTCGACCA
2101	TAGTGACTGG	ATATGTTGTG	TTTTACAGTA	TTATGTAGTC	TGTTTTTTAT	GCAAAATCTA
2161	ATTTAATATA	TTGATATTTA	TATCATTTTA	CGTTTCTCGT	TCAGCTTTCT	TGTACAAAGT
2221	GGTTGATCGC	GTGCATGCGA	CGTCATAGCT	CTCTCCCTAT	AGTGAGTCGT	ATTATAAGCT
2281	AGGCACTGGC	CGTCGTTTTA	CAACGTCGTG	ACTGGGAAAA	CTGCTAGCTT	GGGATCTTTG
2341	TGAAGGAACC	TTACTTCTGT	GGTGTGACAT	AATTGGACAA	ACTACCTACA	GAGATTTAAA
2401	GCTCTAAGGT	AAATATAAAA	TTTTTAAGTG	TATAATGTGT	TAAACTAGCT	GCATATGCTT
2461	GCTGCTTGAG	AGTTTTGCTT	ACTGAGTATG	ATTTATGAAA	ATATTATACA	CAGGAGCTAG
2521	TGATTCTAAT	TGTTTGTGTA	TTTTAGATTG	ACAGTCCCAA	GGCTCATTTT	AGGCCCTCA
2581	GTCCTCACAG	TCTGTTTCATG	ATCATAATCA	GCCATACCAC	ATTTGTAGAG	GTTTTACTTG
2641	CTTTAAAAAA	CCTCCCACAC	CTCCCCCTGA	ACCTGAAACA	TAAAATGAAT	GCAATTGTTG
2701	TTGTAACTT	GTTTATTGCA	GCTTATAATG	GTTACAAATA	AAGCAATAGC	ATCACAAATT
2761	TCACAAATAA	AGCATTTTTT	TCACTGCATT	CTAGTTGTGG	TTTGTCCAAA	CTCATCAATG
2821	TATCTTATCA	TGTCTGGATC	GATCCTGCAT	TAATGAATCG	GCCAACGCGC	GGGGAGAGGC
2881	GGTTTGCCTA	TTGGCTGGCG	TAATAGCGAA	GAGGCCCGCA	CCGATCGCCC	TTCCCAACAG
2941	TTGCGCAGCC	TGAATGGCGA	ATGGGACGCG	CCCTGTAGCG	GCGCATTAAAG	CGCGGCGGGT
3001	GTGGTGGTTA	CGCGCAGCGT	GACCGCTACA	CTTGCCAGCG	CCCTAGCGCC	CGCTCCTTTC
3061	GCTTTCTTCC	CTTCCTTTCT	CGCCACGTTT	GCCGGCTTTC	CCCGTCAAGC	TCTAAATCGG
3121	GGGCTCCCTT	TAGGGTTCCG	ATTTAGTGCT	TTACGGCACC	TCGACCCCAA	AAAACCTTGAT
3181	TAGGGTGATG	GTTACGCTAG	TGGGCCATCG	CCCTGATAGA	CGGTTTTTCG	CCCTTTGACG
3241	TTGGAGTCCA	CGTTCTTTAA	TAGTGGACTC	TTGTTCCAAA	CTGGAACAAC	ACTCAACCCT
3301	ATCTCGGTCT	ATTCTTTTGA	TTTATAAGGG	ATTTTGCCGA	TTTCGGCCTA	TTGGTTAAAA
3361	AATGAGCTGA	TTTAACAAAT	ATTTAACGCG	AATTTTAACA	AAATATTAAC	GTTTACAATT
3421	TCGCCTGATG	CGGTATTTTC	TCCTTACGCA	TCTGTGCGGT	ATTTACACAC	GCATACGCGG
3481	ATCTGCGCAG	CACCATGGCC	TGAAATAACC	TCTGAAAGAG	GAAC TTGGTT	AGGTACCTTC
3541	TGAGGCGGAA	AGAACCAGCT	GTGGAATGTG	TGTCAGTTAG	GGTGTGGAAA	GTCCCCAGGC
3601	TCCCCAGCAG	GCAGAAGTAT	GCAAAGCATG	CATCTCAATT	AGTCAGCAAC	CAGGTGTGGA
3661	AAGTCCCCAG	GCTCCCCAGC	AGGCAGAAGT	ATGCAAAGCA	TGCATCTCAA	TTAGTCAGCA
3721	ACCATAGTCC	CGCCCCTAAC	TCCGCCCATC	CCGCCCTAA	CTCCGCCCAG	TTCCGCCCAT
3781	TCTCCGCCCC	ATGGCTGACT	AATTTTTTTT	ATTTATGCAG	AGGCCGAGGC	CGCCTCGGCC
3841	TCTGAGCTAT	TCCAGAAGTA	GTGAGGAGGC	TTTTTTGGAG	GCCTAGGCTT	TTGCAAAAAG
3901	CTTGATTCTT	CTGACACAAC	AGTCTCGAAC	TTAAGGCTAG	AGCCACCATG	ATTGAACAAG
3961	ATGGATTGCA	CGCAGGTTCT	CCGGCCGCTT	GGGTGGAGAG	GCTATTCGGC	TATGACTGGG
4021	CACAACAGAC	AATCGGCTGC	TCTGATGCCG	CCGTGTTCCG	GCTGTCAGCG	CAGGGGCGCC
4081	CGGTTCTTTT	TGTCAAGACC	GACCTGTCCG	GTGCCCTGAA	TGAACTGCAG	GACGAGGCAG
4141	CGCGGCTATC	GTGGCTGGCC	ACGACGGGCG	TTCCTTGCGC	AGCTGTGCTC	GACGTTGTCA
4201	CTGAAGCGGG	AAGGGACTGG	CTGCTATTGG	GCGAAGTGCC	GGGGCAGGAT	CTCCTGTCAT
4261	CTCACCTTGC	TCCTGCCGAG	AAAGTATCCA	TCATGGCTGA	TGCAATGCGG	CGGCTGCATA
4321	CGCTTGATCC	GGCTACCTGC	CCATTGACCC	ACCAAGCGAA	ACATCGCATC	GAGCGAGCAC

FIG.46C

4381	GTA	CTCGGAT	GGAAGCCGGT	CTTGT	CGATC	AGGATGATCT	GGACGAAGAG	CATCAGGGGC
4441	TCG	CGCCAGC	CGAACTGTTC	GCCAGGCTCA	AGGCGCGCAT	GCCCCGACGGC	GAGGATCTCG	
4501	TCG	TGACCCA	TGGCGATGCC	TGCTTGCCGA	ATATCATGGT	GGAAAATGGC	CGCTTTTCTG	
4561	GAT	TGATCGA	CTGTGGCCGG	CTGGGTGTGG	CGGACCGCTA	TCAGGACATA	GCGTTGGCTA	
4621	CCC	GTGATAT	TGCTGAAGAG	CTTGGCGGCG	AATGGGCTGA	CCGCTTCCTC	GTGCTTTACG	
4681	GTAT	CGCCGC	TCCCGATTCCG	CAGCGCATCG	CCTTCTATCG	CCTTCTTGAC	GAGTTCTTCT	
4741	GAG	CGGGACT	CTGGGGTTTCG	AAATGACCGA	CCAAGCGACG	CCCAACCTGC	CATCACGATG	
4801	GCC	GAATAA	AATATCTTTA	TTTTATTAC	ATCTGTGTGT	TGGTTTTTTG	TGTGAATCGA	
4861	TAG	CGATAAG	GATCCGCGTA	TGGTGCACCTC	TCAGTACAAT	CTGCTCTGAT	GCCGCATAGT	
4921	TAAG	CCAGCC	CCGACACCCG	CCAACACCCG	CTGACGCGCC	CTGACGGGCT	TGTCTGCTCC	
4981	CGG	CATCCGC	TTACAGACAA	GCTGTGACCG	TCTCCGGGAG	CTGCATGTGT	CAGAGGTTTT	
5041	CAC	CGTCATC	ACCGAAACGC	GCGAGACGAA	AGGGCCTCGT	GATACGCTA	TTTTTATAGG	
5101	TTA	ATGTCAT	GATAATAATG	GTTTCTTAGA	CGTCAGGTGG	CACTTTTTCG	GGAAATGTGC	
5161	GCG	GAACCCC	TATTTGTTTA	TTTTTCTAAA	TACATTCAA	TATGTATCCG	CTCATGAGAC	
5221	AATA	ACCCTG	ATAAATGCTT	CAATAATATT	GAAAAAGGAA	GAGTATGAGT	ATTCAACATT	
5281	TCC	GTGTCG	CCTTATTCCC	TTTTTTGCGG	CATTTTGCCT	TCCTGTTTTT	GCTCACCCAG	
5341	AAAC	CGTGGT	GAAAGTAAAA	GATGCTGAAG	ATCAGTTGGG	TGCACGAGTG	GGTTACATCG	
5401	AACT	GGATCT	CAACAGCGGT	AAGATCCTTG	AGAGTTTTTCG	CCCCGAAGAA	CGTTTTTCAA	
5461	TGAT	GAGCAC	TTTTAAAGTT	CTGCTATGTG	GCGCGGTATT	ATCCCGTATT	GACGCCGGGC	
5521	AAG	AGCACT	CGGTCGCCGC	ATACACTATT	CTCAGAATGA	CTTGGTTGAG	TACTCACCAG	
5581	TCAC	AGAAAA	GCATCTTACG	GATGGCATGA	CAGTAAGAGA	ATTATGCAGT	GCTGCCATAA	
5641	CCAT	GAGTGA	TAACACTGCG	GCCAACTTAC	TTCTGACAAC	GATCGGAGGA	CCGAAGGAGC	
5701	TAAC	CGCTTT	TTTGACAAC	ATGGGGGATC	ATGTAACCTG	CCTTGATCGT	TGGGAACCCG	
5761	AGCT	GAATGA	AGCCATACCA	AACGACGAGC	GTGACACCAC	GATGCCTGTA	GCAATGGCAA	
5821	CAAC	GTTGCG	CAAACATTA	ACTGGCGAAC	TACTTACTCT	AGCTTCCCGG	CAACAATTAA	
5881	TAG	ACTGGAT	GGAGGCGGAT	AAAGTTGCAG	GACCACTTCT	GCGCTCGGCC	CTTCCGGCTG	
5941	GCT	GTTTTAT	TGCTGATAAA	TCTGGAGCCG	GTGAGCGTGG	GTCTCGCGGT	ATCATTGCAG	
6001	CACT	GGGGCC	AGATGGTAAG	CCCTCCCGTA	TCGTAGTTAT	CTACACGACG	GGGAGTCAGG	
6061	CAAC	TATGGA	TGAACGAAAT	AGACAGATCG	CTGAGATAGG	TGCCTCACTG	ATTAAGCATT	
6121	GGTA	ACTGTC	AGACCAAGTT	TACTCATATA	TACTTTAGAT	TGATTTAAAA	CTTCATTTTT	
6181	AATTT	AAAAAG	GATCTAGGTG	AAGATCCTTT	TTGATAATCT	CATGACCAAA	ATCCCTTAAC	
6241	GTG	AGTTTTT	GTTCCACTGA	GCGTCAGACC	CCGTAGAAAA	GATCAAAGGA	TCTTCTTGAG	
6301	ATC	TTTTTTTT	TCTGCGCGTA	ATCTGCTGCT	TGCAAACAAA	AAAACCACCG	CTACCAGCGG	
6361	TGG	TTTTGTTT	GCCGGATCAA	GAGCTACCAA	CTCTTTTTTCC	GAAGGTAAC	GGCTTCAGCA	
6421	GAG	CGCAGAT	ACCAAATACT	GTCTTCTAG	TGTAGCCGTA	GTTAGGCCAC	CACTTCAAGA	
6481	ACT	CTGTAGC	ACCGCCTACA	TACCTCGCTC	TGCTAATCCT	GTTACCAGTG	GCTGCTGCCA	
6541	GTG	GGGATAA	GTCGTGTCTT	ACCGGGTTGG	ACTCAAGACG	ATAGTTACCG	GATAAGGCGC	
6601	AGC	GGTCGGG	CTGAACGGGG	GGTTCGTGCA	CACAGCCAG	CTTGGAGCGA	ACGACCTACA	
6661	CCGA	ACTGAG	ATACCTACAG	CGTGAGCATT	GAGAAAGCGC	CACGCTTCCC	GAAGGGAGAA	
6721	AGG	CGGACAG	GTATCCGGTA	AGCGGCAGGG	TCGGAACAGG	AGAGCGCACG	AGGGAGCTTC	
6781	CAG	GGGGGAAA	CGCCTGGTAT	CTTTATAGTC	CTGTCGGGTT	TCGCCACCTC	TGACTTGAGC	
6841	GTC	GATTTTT	GTGATGCTCG	TCAGGGGGGC	GGAGCCTATG	GAAAAACGCC	AGCAACGCGG	
6901	CCT	TTTTTACG	GTTCTTGCC	TTTTGCTGGC	CTTTTGCTCA	CATGTTCTTT	CCTGCGTTAT	
6961	CCC	CTGATTC	TGTGGATAAC	CGTATTACCG	CCTTTGAGTG	AGCTGATACC	GCTCGCCGCA	
7021	GCC	GAACGAC	CGAGCGCAGC	GAGTCAGTGA	GCGAGGAAGC	GGAAGAGCGC	CCAATACGCA	
7081	AAC	CGCCTCT	CCCCGCGCGT	TGGCCGATT	ATTAATGCAG	AGCTTGCAAT	TCGCGCGTTT	
7141	TTCA	ATATTA	TTGAAGCATT	TATCAGGGTT	ATTGTCTCAT	GAGCGGATAC	ATATTTGAAT	
7201	GTAT	TTAGAA	AAATAAACAA	ATAGGGGTT	CGCGCACATT	TCCCCGAAAA	GTGCCACCTG	
7261	ACGT	CTAAGA	AACCATTATT	ATCATGACAT	TAACCTATAA	AAATAGGCGT	AGTACGAGGC	
7321	CCT	TTCACTC	ATTAGATGCA	TGTCGTTACA	TAACCTACGG	TAAATGGCCC	GCCTGGCTGA	
7381	CCG	CCAACG	ACCCCCGCC	ATTGACGTCA	ATAATGACGT	ATGTTCCCAT	AGTAACGCCA	
7441	ATAG	GGACTT	TCCATTGACG	TCAATGGGTG	GAGTATTTAC	G		

FIG.46D

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pDEST27 GST AMINO FUSION IN pCMV Sport-neo VECTOR

CMV promoter mRNA start

600 nac ggt ggg agg tct ata too gca gag ctc gtt tag tga acc gtc aga tgc
ntg cca ccc tcc aga tat att cgt ctc gag caa atc act tgg cag tct agc

651 cct gga gac gcc atc cac gct gtt ttg acc tcc ata gaa gac acc ggg acc
gga cct ctg cgg tag gtg cga caa aac tgg agg tat ctt ctg tgg ccc tgg

702 gat cca gcc tcc gga ctc tag cct agg ccg cgg acc atg gcc cct ata cta
cta ggt cgg agg cct gag atc gga tcc ggc gcc tgg tac cgg gga tat gat
Start Translation GST

753 ggt tat tgg aaa att aag ggc ctt gtg caa ccc act cga ctt ctt ttg gaa
cca ata acc ttt too ttc ccg gaa cac gtt ggg tga gct gaa gaa aac ctt

- GST Protein -

804 tat ctt gaa gaa aaa tat gaa gag cat ttg tat gag cgc gat gaa ggt gat
ata gaa ctt ctt ttt ata ctt ctc gta aac ata ctc gcg cta ctt cca cta

V P R S R

1365 ttt ggt ggt ggc gac cat cct cca aaa tgc gat ctg gtt ccg cgt tct aga
aaa cca cca ccg ctg gta gga ggt ttt agc cta gac caa ggc gca aga tct

S T S L Y K K A

1416 tca aca agt ttg tac aaa aaa gct gaa cga gaa acg
agt tgt tca aac atg ttt ttt cga ctt gct ctt tgc

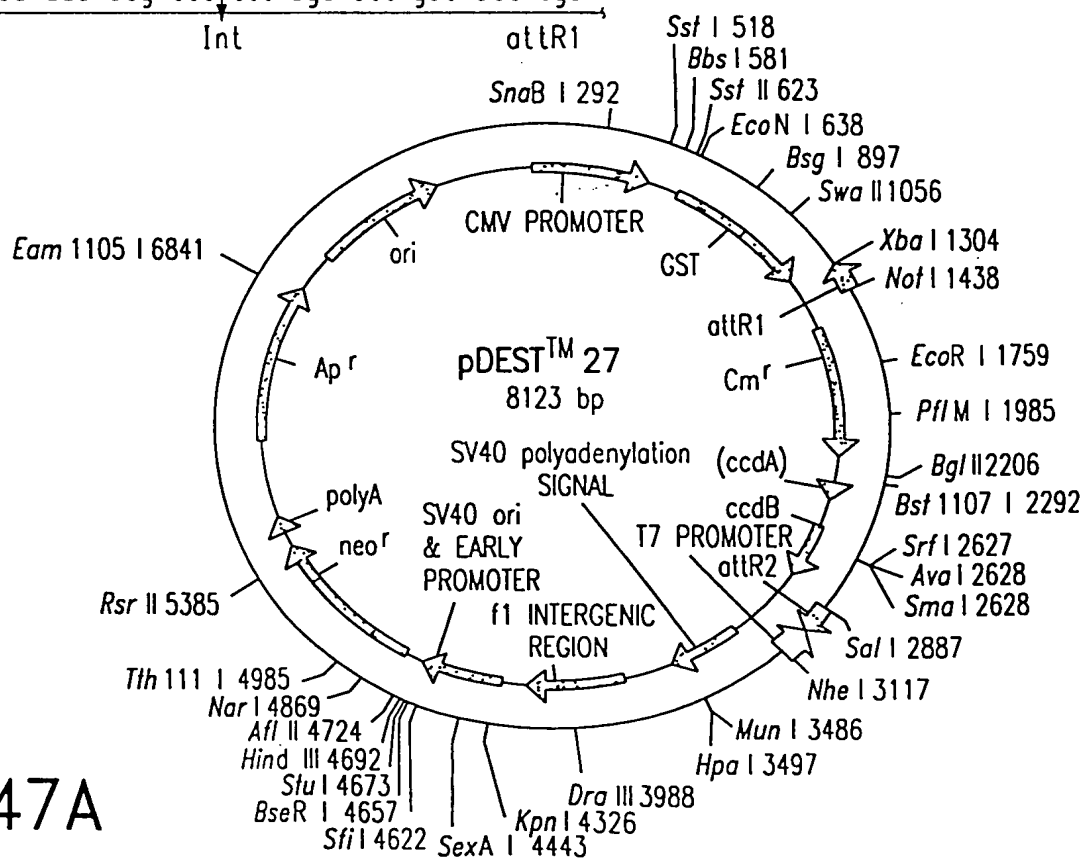


FIG.47A

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pDEST27 8123 bp (rotated to position 7800)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
130..793	GST
803..927	attR1
1036..1695	CmR
1815..1899	inactivated ccdA
2037..2342	ccdB
2383..2507	attR2
2693..3055	SV40 polyA
3250..3705	f1 intergenic region
3769..4187	SV40 promoter
4232..5026	neo
5090..5138	polyA
5549..6409	Apr
6558..7197	ori
7628..27	CMV promoter

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1  ATAAGCAGAG CTCGTTTAGT GAACCGTCAG ATCGCCTGGA GACGCCATCC ACGCTGTTTT
61  GACCTCCATA GAAGACACCG GGACCGATCC AGCCTCCGGA CTCTAGCCTA GGCCGCGGAC
121 CATGGCCCCT ATACTAGGTT ATTGGAAAAT TAAGGGCCTT GTGCAACCCA CTCGACTTCT
181 TTTGGAATAT CTTGAAGAAA AATATGAAGA GCATTTGTAT GAGCGCGATG AAGGTGATAA
241 ATGGCGAAAC AAAAAGTTTG AATTGGGTTT GGAGTTTCCC AATCTTCCTT ATTATATTGA
301 TGGTGATGTT AAATTAACAC AGTCTATGGC CATCATACGT TATATAGCTG ACAAGCACAA
361 CATGTTGGGT GGTGTCCAA AAGAGCGTGC AGAGATTTCA ATGCTTGAAG GAGCGGTTTT
421 GGATATTAGA TACGGTGTTT CGAGAATTGC ATATAGTAAA GACTTTGAAA CTCTCAAAGT
481 TGATTTTCTT AGCAAGCTAC CTGAAATGCT GAAAATGTTC GAAGATCGTT TATGTCATAA
541 AACATATTTA AATGGTGATC ATGTAACCCA TCCTGACTTC ATGTTGTATG ACGCTCTTGA
601 TGTGTGTTTA TACATGGACC CAATGTGCCT GGATGCGTTC CCAAATTAG TTTGTTTTAA
661 AAAACGTATT GAAGCTATCC CACAAATTGA TAAGTACTTG AAATCCAGCA AGTATATAGC
721 ATGGCCTTTG CAGGGCTGGC AAGCCACGTT TGGTGGTGGC GACCATCCTC CAAAATCGGA
781 TCTGGTTCCG CGTTCTAGAT CAACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA
841 TGATATAAAT ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG
901 TAAAACACAA CATATCCAGT CACTATGGCG GCCGCATTAG GCACCCAGG CTTTACACTT
961 TATGCTTCCG GCTCGTATAA TGTGTGGATT TTGAGTTAGG ATCCGGCGAG ATTTTCAGGA
1021 GCTAAGGAAG CTAAAATGGA GAAAAAATC ACTGGATATA CCACCGTTGA TATATCCCAA
1081 TGGCATCGTA AAGAACATTT TGAGGCATTT CAGTCAGTTG CTCAATGTAC CTATAACCAG
1141 ACCGTTTCAGC TGGATATTAC GGCCTTTTTA AAGACCGTAA AGAAAAATAA GCACAAGTTT
1201 TATCCGGCCT TTATTCACAT TCTTGCCCGC CTGATGAATG CTCATCCGGA ATTCCGTATG

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FIG.47B

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1261	GCAATGAAAG	ACGGTGAGCT	GGTGATATGG	GATAGTGTTT	ACCCTTGTTA	CACCGTTTTT
1321	CATGAGCAAA	CTGAAACGTT	TTCATCGCTC	TGGAGTGAAT	ACCACGACGA	TTTCCGGCAG
1381	TTTCTACACA	TATATTCGCA	AGATGTGGCG	TGTTACGGTG	AAAACCTGGC	CTATTTCCCT
1441	AAAGGGTTTA	TTGAGAATAT	GTTTTTCGTC	TCAGCCAATC	CCTGGGTGAG	TTTCACCAGT
1501	TTTGATTTAA	ACGTGGCCAA	TATGGACAAC	TTCTTCGCCC	CCGTTTTTAC	CATGGGCAAA
1561	TATTATACGC	AAGGCGACAA	GGTGCTGATG	CCGCTGGCGA	TTCAGGTTCA	TCATGCCGTC
1621	TGTGATGGCT	TCCATGTCCG	CAGAATGCTT	AATGAATTAC	AACAGTACTG	CGATGAGTGG
1681	CAGGGCGGGG	CGTAAAGATC	TGGATCCGGC	TTACTAAAAG	CCAGATAACA	GTATGCGTAT
1741	TTGCGCGCTG	ATTTTTGCGG	TATAAGAATA	TATACTGATA	TGTATACCCG	AAGTATGTCA
1801	AAAAGAGGTG	TGCTATGAAG	CAGCGTATTA	CAGTGACAGT	TGACAGCGAC	AGCTATCAGT
1861	TGCTCAAGGC	ATATATGATG	TCAATATCTC	CGGTCTGGTA	AGCACAACCA	TGCAGAATGA
1921	AGCCCGTCGT	CTGCGTGCCG	AACGCTGGAA	AGCGGAAAAT	CAGGAAGGGA	TGGCTGAGGT
1981	CGCCCGGTTT	ATTGAAATGA	ACGGCTCTTT	TGCTGACGAG	AACAGGGACT	GGTGAAATGC
2041	AGTTTAAGGT	TTACACCTAT	AAAAGAGAGA	GCCGTTATCG	TCTGTTTGTG	GATGTACAGA
2101	GTGATATTAT	TGACACGCCC	GGGCGACGGA	TGGTGATCCC	CCTGGCCAGT	GCACGTCTGC
2161	TGTCAGATAA	AGTCTCCCGT	GAACTTTACC	CGGTGGTGCA	TATCGGGGAT	GAAAGCTGGC
2221	GCATGATGAC	CACCGATATG	GCCAGTGTGC	CGGTCTCCGT	TATCGGGGAA	GAAGTGGCTG
2281	ATCTCAGCCA	CCGCGAAAAT	GACATCAAAA	ACGCCATTAA	CCTGATGTTT	TGGGGAATAT
2341	AAATGTCAGG	CTCCCTTATA	CACAGCCAGT	CTGCAGGTCG	ACCATAGTGA	CTGGATATGT
2401	TGTGTTTTAC	AGTATTATGT	AGTCTGTTTT	TTATGCAAAA	TCTAATTTAA	TATATTGATA
2461	TTTATATCAT	TTTACGTTTC	TCGTTACAGT	TTCTTGTACA	AAGTGGTTGA	TCGCGTGCAT
2521	GCGACGTCAT	AGCTCTCTCC	CTATAGTGAG	TCGTATTATA	AGCTAGGCAC	TGGCCGTCGT
2581	TTTACAACGT	CGTGACTGGG	AAAAGTCTA	GCTTGGGATC	TTTGTGAAGG	AACCTTACTT
2641	CTGTGGTGTG	ACATAATTGG	ACAACTACC	TACAGAGATT	TAAAGCTCTA	AGGTAAATAT
2701	AAAATTTTTA	AGTGTATAAT	GTGTTAAACT	AGCTGCATAT	GCTTGCTGCT	TGAGAGTTTT
2761	GCTTACTGAG	TATGATTTAT	GAAAATATTA	TACACAGGAG	CTAGTGATTC	TAATTGTTTG
2821	TGTATTTTAG	ATTCACAGTC	CCAAGGCTCA	TTTCAGGCC	CTCAGTCCTC	ACAGTCTGTT
2881	CATGATCATA	ATCAGCCATA	CCACATTTGT	AGAGGTTTTA	CTTGCTTTAA	AAAACCTCCC
2941	ACACCTCCCC	CTGAACCTGA	AACATAAAAT	GAATGCAATT	GTTGTTGTTA	ACTTGTTTAT
3001	TGCAGCTTAT	AATGGTTACA	AATAAAGCAA	TAGCATCACA	AATTTACAAA	ATAAAGCATT
3061	TTTTTCACTG	CATTCTAGTT	GTGGTTTGTC	CAAACATC	AATGTATCTT	ATCATGTCTG
3121	GATCGATCCT	GCATTAATGA	ATCGGCCAAC	GCGCGGGGAG	AGGCGGTTTG	CGTATTGGCT
3181	GGCGTAATAG	CGAAGAGGCC	CGCACCGATC	GCCCTTCCCA	ACAGTTGCGC	AGCCTGAATG
3241	GCGAATGGGA	CGCGCCCTGT	AGCGGCGCAT	TAAGCGCGGC	GGGTGTGGTG	GTTACGCGCA
3301	GCGTGACCGC	TACACTTGCC	AGCGCCCTAG	CGCCCGCTCC	TTTCGCTTTC	TTCCCTTCCT
3361	TTCTCGCCAC	GTTCGCCGGC	TTTCCCCGTC	AAGCTCTAAA	TCGGGGGCTC	CCTTTAGGGT
3421	TCCGATTTAG	TGCTTTACGG	CACCTCGACC	CAAAAAAAT	TGATTAGGGT	GATGGTTCAC
3481	GTAGTGGGCC	ATCGCCCTGA	TAGACGGTTT	TTCGCCCTTT	GACGTTGGAG	TCCACGTTCT
3541	TTAATAGTGG	ACTCTTGTTT	CAAAGTGGAA	CAAACTCAA	CCCTATCTCG	GTCTATTCTT
3601	TTGATTTATA	AGGGATTTTG	CCGATTTTCG	CCTATTGGTT	AAAAAATGAG	CTGATTTAAC

FIG.47C

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3661	AAATATTTAA	CGCGAATTTT	AACAAAATAT	TAACGTTTAC	AATTTTCGCT	GATGCGGTAT
3721	TTTCTCCTTA	CGCATCTGTG	CGGTATTTCA	CACCGCATAC	GCGGATCTGC	GCAGCACCAT
3781	GGCCTGAAAT	AACCTCTGAA	AGAGGAACTT	GGTTAGGTAC	CTTCTGAGGC	GGAAAGAACC
3841	AGCTGTGGAA	TGTGTGTCAG	TTAGGGTGTG	GAAAGTCCCC	AGGCTCCCCA	GCAGGCAGAA
3901	GTATGCAAAG	CATGCATCTC	AATTAGTCAG	CAACCAGGTG	TGGAAAGTCC	CCAGGCTCCC
3961	CAGCAGGCAG	AAGTATGCAA	AGCATGCATC	TCAATTAGTC	AGCAACCATA	GTCCCGCCCC
4021	TAAC TCCGCC	CATCCCGCCC	CTAACTCCGC	CCAGTTCCGC	CCATTCTCCG	CCCCATGGCT
4081	GACTAATTTT	TTTTATTTAT	GCAGAGGCCG	AGGCCGCCTC	GGCCTCTGAG	CTATTCCAGA
4141	AGTAGTGAGG	AGGCTTTTTT	GGAGGCCTAG	GCTTTTGCAA	AAAGCTTGAT	TCTTCTGACA
4201	CAACAGTCTC	GAAC TTAAGG	CTAGAGCCAC	CATGATTGAA	CAAGATGGAT	TGCACGCAGG
4261	TTCTCCGGCC	GCTTGGGTGG	AGAGGCTATT	CGGCTATGAC	TGGGCACAAC	AGACAATCGG
4321	CTGCTCTGAT	GCCGCCGTGT	TCCGGCTGTC	AGCGCAGGGG	CGCCCGGTTT	TTTTTGTCAA
4381	GACCGACCTG	TCCGGTGCCC	TGAATGAACT	GCAGGACGAG	GCAGCGCGGC	TATCGTGGCT
4441	GGCCACGACG	GGCGTTCCTT	GCGCAGCTGT	GCTCGACGTT	GTCAGTGAAG	CGGGAAGGGA
4501	CTGGCTGCTA	TTGGGCGAAG	TGCCGGGGCA	GGATCTCCTG	TCATCTCACC	TTGCTCCTGC
4561	CGAGAAAGTA	TCCATCATGG	CTGATGCAAT	GCGGCGGCTG	CATACGCTTG	ATCCGGCTAC
4621	CTGCCCATTG	GACCACCAAG	CGAAACATCG	CATCGAGCGA	GCACGTACTC	GGATGGAAGC
4681	CGGTCTTGTC	GATCAGGATG	ATCTGGACGA	AGAGCATCAG	GGGCTCGCGC	CAGCCGAACT
4741	GTTCGCCAGG	CTCAAGGCGC	GCATGCCCGA	CGGCGAGGAT	CTCGTCGTGA	CCCATGGCGA
4801	TGCCTGCTTG	CCGAATATCA	TGGTGGAAAA	TGGCCGCTTT	TCTGGATTCA	TCGACTGTGG
4861	CCGGCTGGGT	GTGGCGGACC	GCTATCAGGA	CATAGCGTTG	GCTACCCGTG	ATATTGCTGA
4921	AGAGCTTGGC	GGCGAATGGG	CTGACCGCTT	CCTCGTGCTT	TACGGTATCG	CCGCTCCCGA
4981	TTCGCAGCGC	ATCGCCTTCT	ATCGCCTTCT	TGACGAGTTC	TTCTGAGCGG	GACTCTGGGG
5041	TTCGAAATGA	CCGACCAAGC	GACGCCCAAC	CTGCCATCAC	GATGGCCGCA	ATAAAATATC
5101	TTTATTTTCA	TTACATCTGT	GTGTTGGTTT	TTTGTGTGAA	TCGATAGCGA	TAAGGATCCG
5161	CGTATGGTGC	ACTCTCAGTA	CAATCTGCTC	TGATGCCGCA	TAGTTAAGCC	AGCCCCGACA
5221	CCCGCCAACA	CCCGCTGACG	CGCCCTGACG	GGCTTGTCTG	CTCCCGGCAT	CCGCTTACAG
5281	ACAAGCTGTG	ACCGTCTCCG	GGAGCTGCAT	GTGTCAGAGG	TTTTACCCGT	CATCACCGAA
5341	ACGCGCGAGA	CGAAAGGGCC	TCGTGATACG	CCTATTTTAA	TAGGTTAATG	TCATGATAAT
5401	AATGGTTTCT	TAGACGTCAG	GTGGCACTTT	TCGGGGAAAT	GTGCGCGGAA	CCCCTATTTG
5461	TTTATTTTTC	TAAATACATT	CAAATATGTA	TCCGCTCATG	AGACAATAAC	CCTGATAAAT
5521	GCTTCAATAA	TATTGAAAAA	GGAAGAGTAT	GAGTATTCAA	CATTTCCGTG	TCGCCCTTAT
5581	TCCCTTTTTT	GCGGCATTTT	GCCTTCCTGT	TTTTGCTCAC	CCAGAAACGC	TGGTGAAAGT
5641	AAAAGATGCT	GAAGATCAGT	TGGGTGCACG	AGTGGGTTAC	ATCGAACTGG	ATCTCAACAG
5701	CGGTAAGATC	CTTGAGAGTT	TTGCCCCGGA	AGAAGTTTTT	CCAATGATGA	GCACTTTTAA
5761	AGTTCTGCTA	TGTGGCGCGG	TATTATCCCG	TATTGACGCC	GGGCAAGAGC	AACTCGGTCTG
5821	CCGCATACAC	TATTCTCAGA	ATGACTTGGT	TGAGTACTCA	CCAGTCACAG	AAAAGCATCT
5881	TACGGATGGC	ATGACAGTAA	GAGAATTATG	CAGTGCTGCC	ATAACCATGA	GTGATAACAC
5941	TGCGGCCAAC	TACTTCTGA	CAACGATCGG	AGGACCGAAG	GAGCTAACCG	CTTTTTTGCA
6001	CAACATGGGG	GATCATGTAA	CTCGCCTTGA	TCGTTGGGAA	CCGGAGCTGA	ATGAAGCCAT

FIG.47D

6061 ACCAAACGAC GAGCGTGACA CCACGATGCC TGTAGCAATG GCAACAACGT TGC GCAAAC T
 6121 ATTAAC TGGC GAACTACTTA CTCTAGCTTC CCGGCAACAA TTAATAGACT GGATGGAGGC
 6181 GGATAAAGTT GCAGGACCAC TTCTGCGCTC GGCCCTTCCG GCTGGCTGGT TTATTGCTGA
 6241 TAAATCTGGA GCCGGTGAGC GTGGGTCTCG CGGTATCATT GCAGCACTGG GGCCAGATGG
 6301 TAAGCCCTCC CGTATCGTAG TTATCTACAC GACGGGGAGT CAGGCAACTA TGGATGAACG
 6361 AAATAGACAG ATCGCTGAGA TAGGTGCCTC ACTGATTAAG CATTGGTAAC TGTCAGACCA
 6421 AGTTTACTCA TATATACTTT AGATTGATTT AAAACTTCAT TTTTAATTTA AAAGGATCTA
 6481 GGTGAAGATC CTTTTTGATA ATCTCATGAC CAAAATCCCT TAACGTGAGT TTTCGTTCCA
 6541 CTGAGCGTCA GACCCCGTAG AAAAGATCAA AGGATCTTCT TGAGATCCTT TTTTCTGCG
 6601 CGTAATCTGC TGCTTGCAAA CAAAAAACC ACCGCTACCA GCGGTGGTTT GTTTGCCGGA
 6661 TCAAGAGCTA CCAACTCTTT TTCCGAAGGT AACTGGCTTC AGCAGAGCGC AGATACCAAA
 6721 TACTGTCTTT CTAGTGTAGC CGTAGTTAGG CCACCACTTC AAGAACTCTG TAGCACCGCC
 6781 TACATACCTC GCTCTGCTAA TCCTGTTACC AGTGGCTGCT GCCAGTGGCG ATAAGTCGTG
 6841 TCTTACCGGG TTGGA CTCAA GACGATAGTT ACCGGATAAG GCGCAGCGGT CGGGCTGAAC
 6901 GGGGGGTTTCG TGCACACAGC CCAGCTTGGA GCGAACGACC TACACCGAAC TGAGATACCT
 6961 ACAGCGTGAG CATTGAGAAA GCGCCACGCT TCCCGAAGGG AGAAAGGCGG ACAGGTATCC
 7021 GGTAAGCGGC AGGGTCGGAA CAGGAGAGCG CACGAGGGAG CTTCCAGGGG GAAACGCCTG
 7081 GTATCTTTAT AGTCCTGTGC GGTTCGCCA CCTCTGACTT GAGCGTCGAT TTTTGTGATG
 7141 CTCGTCAGGG GGGCGGAGCC TATGGAAAAA CGCCAGCAAC GCGGCCTTTT TACGGTTCCT
 7201 GGCCTTTTGC TGGCCTTTTG CTCACATGTT CTTTCCTGCG TTATCCCTG ATTCTGTGGA
 7261 TAACCGTATT ACCGCCTTTG AGTGAGCTGA TACCGCTCGC CGCAGCCGAA CGACCGAGCG
 7321 CAGCGAGTCA GTGAGCGAGG AAGCGGAAGA GCGCCCAATA CGCAAACCGC CTCTCCCCGC
 7381 GCGTTGGCCG ATTCATTAAT GCAGAGCTTG CAATTCGCGC GTTTTTCAAT ATTATTGAAG
 7441 CATTTATCAG GGTTATTGTC TCATGAGCGG ATACATATTT GAATGTATTT AGAAAAATAA
 7501 ACAAATAGGG GTTCCGCGCA CATTTCCCCG AAAAGTGCCA CCTGACGTCT AAGAAACCAT
 7561 TATTATCATG ACATTAACCT ATAAAAATAG GCGTAGTACG AGGCCCTTTC ACTCATTAGA
 7621 TGCATGTCGT TACATAACTT ACGGTAAATG GCCCGCCTGG CTGACCGCCC AACGACCCCC
 7681 GCCCATTGAC GTCAATAATG ACGTATGTTT CCATAGTAAC GCCAATAGGG ACTTTCCATT
 7741 GACGTCAATG GGTGGAGTAT TTACGGTAAA CTGCCCCTT GGCAGTACAT CAAGTGTATC
 7801 ATATGCCAAG TACGCCCCCT ATTGACGTCA ATGACGGTAA ATGGCCCGCC TGGCATTATG
 7861 CCCAGTACAT GACCTTATGG GACTTTTCTA CTTGGCAGTA CATCTACGTA TTAGTCATCG
 7921 CTATTACCAT GGTGATGCGG TTTTGGCAGT ACATCAATGG GCGTGGATAG CGGTTTGACT
 7981 CACGGGGATT TCCAAGTCTC CACCCATTG ACGTCAATGG GAGTTTGT TT TGGCACCAAA
 8041 ATCAACGGGA CTTTCCAAAA TGTCGTAACA ACTCCGCCCC ATTGACGCAA ATGGGCGGTA
 8101 GCGGTGTACG GTGGGAGGTC TAT

FIG.47E

pEXP501: pCMV-SPORT 6 HOST FOR attB LIBRARIES

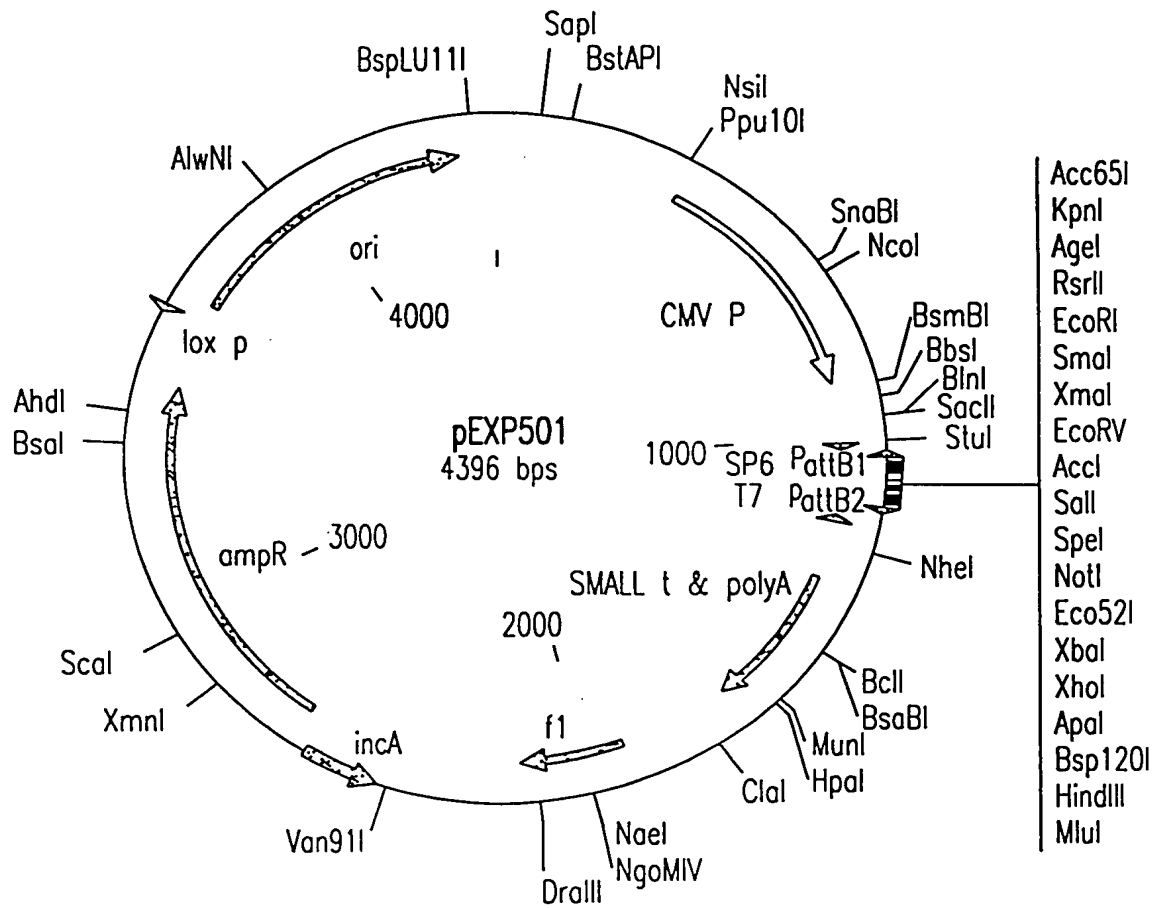


FIG.48A

pEXP501(cont'd)

FEATURES OF THE attB CLONING VECTOR, pEXP501.
BASES WITHIN HATCHED AREA ARE REPLACED BY cDNA
IN SOME LTI cDNA LIBRARIES.

86B

—aga gct cgt tta gtg aac cgt cag atc gcc tgg aga cgc cat cca
—tct cga gca aat cac ttg gca gtc tag cgg acc tct gcg gta ggt

cgc tgt ttt gac ctc cat aga aga cac cgg gac cga tcc agc ctc
gcg aca aaa ctg gag gta tct tct gtg gcc ctg gct agg tct gag

SstI LTI rev PRIMER
cgg act cta gcc tag gcc ggc gag cgg ata aca att tca cac agg
gcc tga gat cgg atc cgg cgc ctc gcc tat tgt taa agt gtg tcc

ABI rev PRIMER Stu SP6 PROMOTER SP6
aaa cag cta tga cca tta ggc cta ttt agg tga cac tat aga aca
ttt gtc gat act ggt aat ccg gat aaa tcc act gtg ata tct tgt

Int attB1 Age Kpn RsrII EcoRI Sma
agt ttg tac aaa aaa gca ggc tgg tac cga tcc gga att ccc ggg
tca aac atg ttt ttt cgt ccg acc atg gcc agg cct taa ggg ccc

EcoRV Sal Spe Not Xba
ata tct tct atg agc tca cta gtc ggc ggc cgc tct aga gta tcc
tat agc agc tgc tct aat gat cga ccg ccg ggc aga tct cat agg

XhoI ApaI HindIII Mlu attB2 Int
ctc gag ggg ccc agc ctt acg cgt acc cag ctt tct tgt aca aag
gag ctc ccc ggg ttc gaa tgc gca tgg gtc gaa aga aca tgt ttc

tgg tcc cta tag tga gtc gta tta taa gct agg cac tgg ccg tct
acc agg gat atc act cag cat aat att cga tcc gtg acc ggc agc
T7 T7 PROMOTER ABI fwd

Nhe 1272
ttt tac aac gtc gtg act ggg aaa act gct agc ttg gga tct ttg
aaa atg ttg cag cac tga ccc ttt tga cga tgg aac cct aga aac

LTI fwd

FIG.48B

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pEXP501 4396 bp

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1 CCATTCGCCA TTCAGGCTGC GCAACTGTTG GGAAGGGCGA TCGGTGCGGG CCTCTTCGCT
61 ATTACGCCAG CCAATACGCA AACCGCCTCT CCCCgcgcgt TGGCCGATTc ATTAATGCAG
121 GATCGATCCA GACATGATAA GATACATTGA TGAGTTTGGa CAAACCACAA CTAGAATGCA
181 GTGAAAAAAA TGCTTTATTT GTGAAATTTG TGATGCTATT GCTTTATTTG TAACCATTAT
241 AAGCTGCAAT AAACAAGTTA ACAACAACAA TTGCATTcAT TTTATGTTTC AGGTTCAGGG
301 GGAGGTGTGG GAGGTTTTTT AAAGCAAGTA AAACCTCTAC AAATGTGGTA TGGCTGATTA
361 TGATCATGAA CAGACTGTGA GGACTGAGGG GCCTGAAATG AGCCTTGgGA CTGTGAATCT
421 AAAATACACA AACAATTAGA ATCACTAGCT CCTGTGTATA ATATTTTCAT AAATCATACT
481 CAGTAAGCAA AACTCTCAAG CAGCAAGCAT ATGCAGCTAG TTTAACACAT TATACTTTA
541 AAAATTTTAT ATTTACCTTA GAGCTTTAAA TCTCTGTAGG TAGTTTGTCC AATTATGTCA
601 CACCACAGAA GTAAGGTTCC TTCACAAAGA TCCCAAGCTA GCAGTTTTCc CAGTCACGAC
661 GTTGTAAGAA GACGGCCAGT GCCTAGCTTA TAATACGACT CACTATAGGG ACCACTTTGT
721 ACAAGAAAGC TGGGTACGCG TAAGCTTGGG CCCCTCGAGG GATCCTCTAG AGCGGCCGCC
781 GACTAGTGAG CTCGTCGACG ATATCCCGGG AATTCCGGAC CGGTACCAGC CTGCTTTTTT
841 GTACAAACTT GTTCTATAGT GTCACCTAAA TAGGCCTAAT GGTcATAGCT GTTTCCTGTG
901 TGAAATTGTT ATCCGCTCCG CGGCCTAGGC TAGAGTCCGG AGGCTGGATC GGTCCCgGTG
961 TCTTCTATGG AGGTCAAAAC AGCGTGGATG GCGTCTCCAG GCGATCTGAC GGTTCACTAA
1021 ACGAGCTCTG CTTATATAGA CCTCCCACCG TACACGCCTA CCGCCcATTt GCGTCAATGG
1081 GCGGGAGTTG TTACGACATT TTGGAAAGTC CCGTTGATTT TGGTGCCAAA ACAAACTCCC
1141 ATTGACGTCA ATGGGGTGGA GACTTGGAAG TCCCGTGAG TCAAACCGCT ATCCACGCCc
1201 ATTGATGTAC TGCCAAAACC GCATCACCAT GGTAATAGCG ATGACTAATA CGTAGATGTA
1261 CTGCCAAGTA GGAAAGTCCC ATAAGGTCAT GTACTGGGCA TAATGCCAGG CGGGCCATTt
1321 ACCGTCATTG ACGTCAATAG GGGGCGTACT TGGCATATGA TACACTTGAT GTACTGCCAA
1381 GTGGGCAGTT TACCGTAAAT ACTCCACCCA TTGACGTCAA TGGAAAGTCC CTATTGGCGT
1441 TACTATGGGA ACATACGTCA TTATTGACGT CAATGGGCGG GGGTCGTTGG GCGGTCAGCC
1501 AGGCGGGCCA TTTACCGTAA GTTATGTAAC GACATGCATC TAATGAGTGA AAGGGCCTCG
1561 TACTACGCCT ATTTTATAG GTTAATGTCA TGATAATAAT GGTTTCTTAG ACGTCAGGTG
1621 GCACTTTTCG GGGAAATGTG CGCGGAACCC CTATTTGTTT ATTTTCTAA ATACATTCAA
1681 ATATGTATCC GCTCATGAGA CAATAACCCT GATAAATGCT TCAATAATAT TGAAAAACGC
1741 GCGAATTGCA AGCTCTGCAT TAATGAATCG GCCAACGCGC GGGGAGAGGC GGTTTGCGTA
1801 TTGGGCGCTC TTCCGCTTCC TCGCTCACTG ACTCGCTGCG CTCGGTCGTT CGGCTGCGGC
1861 GAGCGGTATC AGCTCACTCA AAGGCGGTAA TACGGTTATC CACAGAATCA GGGGATAACG
1921 CAGGAAAGAA CATGTGAGCA AAAGGCCAGC AAAAGGCCAG GAACCGTAAA AAGGCCGCGT
1981 TGCTGGCGTT TTTCCATAGG CTCCGCCCCC CTGACGAGCA TCACAAAAAT CGACGCTCAA
2041 GTCAGAGGTG GCGAAACCCG ACAGGACTAT AAAGATACCA GCGGTTTCCC CCTGGAAGCT
2101 CCCTCGTGCG CTCTCCTGTT CCGACCCTGC CGCTTACCGG ATACCTGTCC GCCTTCTCTC
2161 CTTcGGGAAG CGTGGCGCTT TCTCAATGCT CACGCTGTAG GTATCTCAGT TCGGTGTAGG
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FIG.48C

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2221 TCGTTCGCTC CAAGCTGGGC TGTGTGCACG AACCCCCCGT TCAGCCCGAC CGCTGCGCCT
2281 TATCCGGTAA CTATCGTCTT GAGTCCAACC CGGTAAGACA CGACTTATCG CCACTGGCAG
2341 CAGCCACTGG TAACAGGATT AGCAGAGCGA GGTATGTAGG CGGTGCTACA GAGTTCTTGA
2401 AGTGGTGGCC TAACTACGGC TACACTAGAA GGACAGTATT TGGTATCTGC GCTCTGCTGA
2461 AGCCAGTTAC CTTTCGGAAAA AGAGTTGGTA GCTCTTGATC CGGCAAACAA ACCACCGCTG
2521 GTAGCGGTGG TTTTTTTGTT TGCAAGCAGC AGATTACGCG CAGAAAAAAA GGATCTCAAG
2581 AAGATCCTTT GATCTTTTCT ACGGGGTCTG ACGCTCAGTG GAACGAAAAC TCACGTAAAG
2641 GGATTTTGGT CATGCCATAA CTTCTGTATAG CATAATTAT ACGAAGTTAT GGCATGAGAT
2701 TATCAAAAAG GATCTTCACC TAGATCCTTT TAAATTAAAA ATGAAGTTTT AAATCAATCT
2761 AAAGTATATA TGAGTAACT TGGTCTGACA GTTACCAATG CTTAATCAGT GAGGCACCTA
2821 TCTCAGCGAT CTGTCTATTT CGTTCATCCA TAGTTGCCTG ACTCCCCGTC GTGTAGATAA
2881 CTACGATACG GGAGGGCTTA CCATCTGGCC CCAGTGCTGC AATGATACCG CGAGACCCAC
2941 GCTCACCGGC TCCAGATTTA TCAGCAATAA ACCAGCCAGC CGGAAGGGCC GAGCGCAGAA
3001 GTGGTCCTGC AACTTTATCC GCCTCCATCC AGTCTATTAA TTGTTGCCGG GAAGCTAGAG
3061 TAAGTAGTTC GCCAGTTAAT AGTTTGCGCA ACGTTGTTGC CATTGCTACA GGCATCGTGG
3121 TGTCACGCTC GTCGTTTGGT ATGGCTTCAT TCAGCTCCGG TTCCCAACGA TCAAGGCGAG
3181 TTACATGATC CCCCATGTTG TGCAAAAAG CGGTTAGCTC CTTCGGTCCT CCGATCGTTG
3241 TCAGAAGTAA GTTGGCCGCA GTGTTATCAC TCATGGTTAT GGCAGCACTG CATAATTCTC
3301 TTA CTGTCAT GCCATCCGTA AGATGCTTTT CTGTGACTGG TGAGTACTCA ACCAAGTCAT
3361 TCTGAGAATA GTGTATGCGG CGACCGAGTT GCTCTTGCCC GGCCTCAATA CGGGATAATA
3421 CCGCGCCACA TAGCAGAACT TTAAAAGTGC TCATCATTGG AAAACGTTCT TCGGGGCGAA
3481 AACTCTCAAG GATCTTACCG CTGTTGAGAT CCAGTTCGAT GTAACCCACT CGTGACCCCA
3541 ACTGATCTTC AGCATCTTTT ACTTTCACCA GCGTTTCTGG GTGAGCAAAA ACAGGAAGGC
3601 AAAATGCCGC AAAAAAGGGA ATAAGGGCGA CACGGAAATG TTGAATACTC ATACTCTTCC
3661 TTTTCAATA TTATTGAAGC ATTTATCAGG GTTATTGTCT CATGCCAGGG GTGGGCACAC
3721 ATATTTGATA CCAGCGATCC CTACACAGCA CATAATTCAA TGCGACTTCC CTCTATCGCA
3781 CATCTTAGAC CTTTATTCTC CCTCCAGCAC ACATCGAAGC TGCCGAGCAA GCCGTTCTCA
3841 CCAGTCCAAG ACCTGGCATG AGCGGATACA TATTTGAATG TATTTAGAAA AATAAACAAA
3901 TAGGGGTTCC GCGCACATTT CCCCAGAAAAG TGCCACCTGA AATTGTAAAC GTTAATATTT
3961 TGTTAAAATT CGCGTTAAAT TTTTGTTAAA TCAGCTCATT TTTTAACCAA TAGGCCGAAA
4021 TCGGCAAAAT CCCTTATAAA TCAAAAGAAT AGACCGAGAT AGGGTTGAGT GTTGTTCCAG
4081 TTTGGAACAA GAGTCCACTA TTAAAGAACG TGGACTCCAA CGTCAAAGGG CGAAAAACCG
4141 TCTATCAGGG CGATGGCCCA CTACGTGAAC CATCACCCTA ATCAAGTTTT TTGGGGTCGA
4201 GGTGCCGTAA AGCACTAAAT CGGAACCCTA AAGGGAGCCC CCGATTTAGA GCTTGACGGG
4261 GAAAGCCGGC GAACGTGGCG AGAAAGGAAG GGAAGAAAGC GAAAGGAGCG GGCCTAGGG
4321 CGCTGGCAAG TGTAGCGGTC ACGCTGCGCG TAACCACCAC ACCCGCCGCG CTTAATGCGC
4381 CGCTACAGGG CGCGTC

FIG.48D

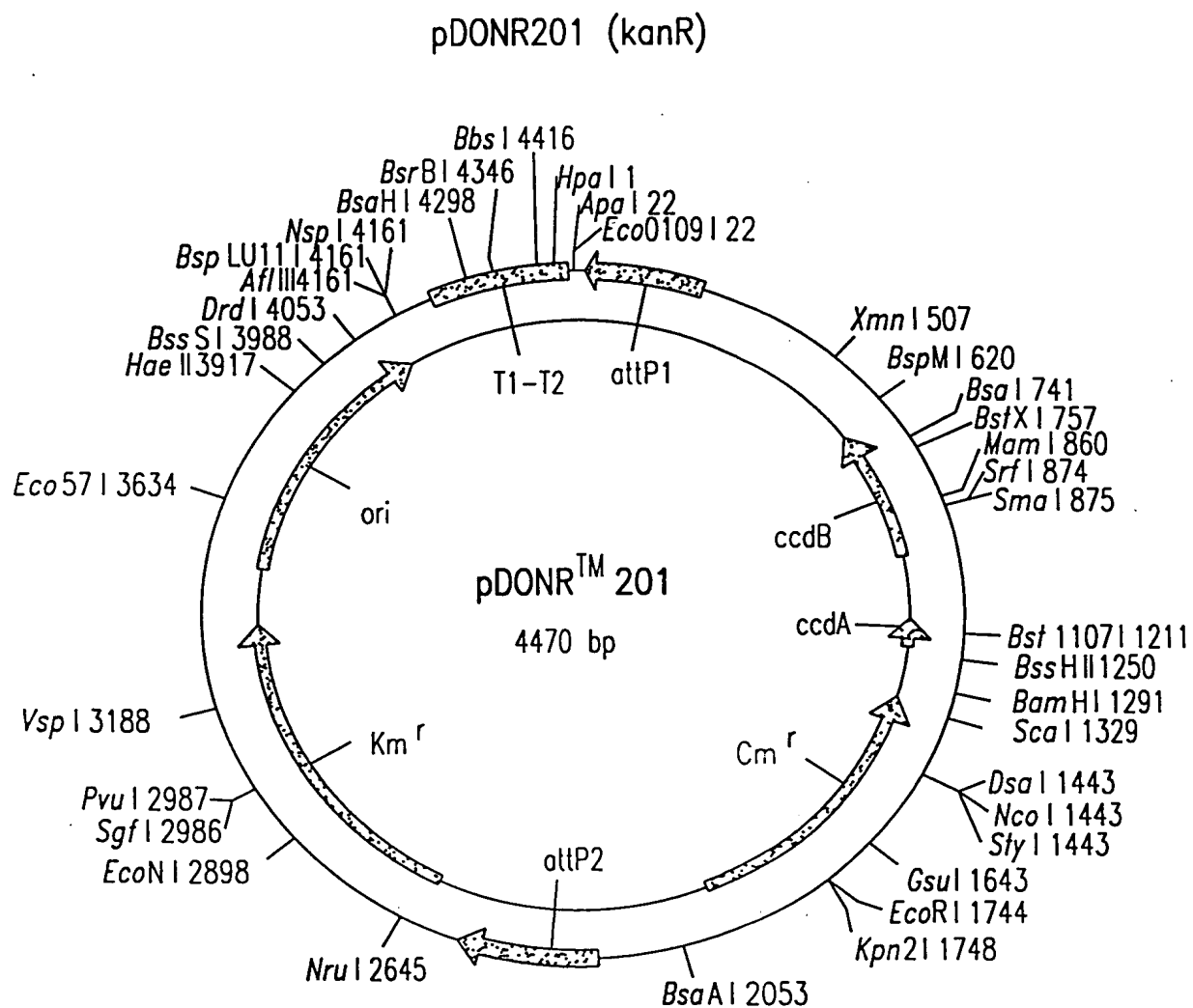


FIG.49A

156/253

pDONR201 4470 bp (rotated to position 3516)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
260..29	attP1
656..961	ccdB
1099..1184	ccdA
1303..1962	CmR
2210..2442	attP2
2565..3374	Kmr
3495..4134	ori

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1  GTTAACGCTA GCATGGATCT CGGGCCCCAA ATAATGATTT TATTTTGACT GATAGTGACC
61  TGTTCGTTGC AACAAATTGA TGAGCAATGC TTTTATAA TGCCAACTTT GTACAAAAAA
121 GCTGAACGAG AAACGTAAAA TGATATAAAT ATCAATATAT TAAATTAGAT TTTGCATAAA
181 AAACAGACTA CATAATACTG TAAAACACAA CATATCCAGT CACTATGAAT CAACTACTTA
241 GATGGTATTA GTGACCTGTA GTCGACCGAC AGCCTTCCAA ATGTTCTTCG GGTGATGCTG
301 CCAACTTAGT CGACCGACAG CCTTCCAAAT GTTCTTCTCA AACGGAATCG TCGTATCCAG
361 CCTACTCGCT ATTGTCCTCA ATGCCGTATT AAATCATAAA AAGAAATAAG AAAAAGAGGT
421 GCGAGCCTCT TTTTGTGTG ACAAATAAA AACATCTACC TATTCATATA CGCTAGTGTC
481 ATAGTCCTGA AAATCATCTG CATCAAGAAC AATTTACAA CTCTTATACT TTTCTCTTAC
541 AAGTCGTTCT GCTTCATCTG GATTTTCAGC CTCTATACTT ACTAAACGTG ATAAAGTTTC
601 TGTAATTTCT ACTGTATCGA CCTGCAGACT GGCTGTGTAT AAGGGAGCCT GACATTTATA
661 TTCCCCAGAA CATCAGGTTA ATGGCGTTTT TGATGTCATT TTCGCGGTGG CTGAGATCAG
721 CCACTTCTTC CCCGATAACG GAGACCGGCA CACTGGCCAT ATCGGTGGTC ATCATGCGCC
781 AGCTTTCATC CCCGATATGC ACCACCGGGT AAAGTTCACG GGAGACTTTA TCTGACAGCA
841 GACGTGCACT GGCCAGGGGG ATCACCATCC GTCGCCCGGG CGTGTCAATA ATATCACTCT
901 GTACATCCAC AAACAGACGA TAACGGCTCT CTCTTTTATA GGTGTAAACC TTAAACTGCA
961 TTTCACCACT CCCTGTTCTC GTCAGCAAAA GAGCCGTTCA TTTCAATAAA CCGGGCGACC
1021 TCAGCCATCC CTTCTGATT TTCCGCTTTC CAGCGTTCGG CACGCAGACG ACGGGCTTCA
1081 TTCTGCATGG TTGTGCTTAC CAGACCGGAG ATATTGACAT CATATATGCC TTGAGCAACT
1141 GATAGCTGTC GCTGTCAACT GTCAGTGTAA TACGCTGCTT CATAGCACAC CTCTTTTGA
1201 CATACTTCGG GTATACATAT CAGTATATAT TCTTATACCG CAAAATCAG CGCGCAAATA
1261 CGCATACTGT TATCTGGCTT TTAGTAAGCC GGATCCACGC GATTACGCC CGCCCTGCCA
1321 CTCATCGCAG TACTGTTGTA ATTCATTAAG CATTCTGCCG ACATGGAAGC CATCACAGAC
1381 GGCATGATGA ACCTGAATCG CCAGCGGCAT CAGCACCTTG TCGCCTTGCG TATAATATTT
1441 GCCCATGGTG AAAACGGGGG CGAAGAAGTT GTCCATATTG GCCACGTTTA AATCAAACT
1501 GGTGAAACTC ACCCAGGGAT TGGCTGAGAC GAAAAACATA TTCTCAATAA ACCCTTTAGG
1561 GAAATAGGCC AGGTTTTAC CGTAACACGC CACATCTTGC GAATATATGT GTAGAAACTG
1621 CCGGAAATCG TCGTGGTATT CACTCCAGAG CGATGAAAAC GTTTCAGTTT GCTCATGGAA
1681 AACGGTGTA CAAGGGTGAA CACTATCCCA TATCACCAGC TCACCGTCTT TCATTGCCAT
1741 ACGGAATTCC GGATGAGCAT TCATCAGGCG GGCAAGAATG TGAATAAAGG CCGGATAAAA
1801 CTTGTGCTTA TTTTCTTTA CGGTCTTTAA AAAGGCCGTA ATATCCAGCT GAACGGTCTG
1861 GTTATAGGTA CATTGAGCAA CTGACTGAAA TGCCTCAAAA TGTTCTTTAC GATGCCATTG
1921 GGATATATCA ACGGTGGTAT ATCCAGTGAT TTTTCTCC ATTTAGCTT CCTTAGCTCC

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FIG.49B

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1981	TGAAAATCTC	GATAACTCAA	AAAATACGCC	CGGTAGTGAT	CTTATTTTCAT	TATGGTGAAA
2041	GTTGGAACCT	CTTACGTGCC	GATCAACGTC	TCATTTTTCGC	CAAAAAGTTGG	CCCAGGGCTT
2101	CCCGGTATCA	ACAGGGACAC	CAGGATTTAT	TTATTCTGCG	AAGTGATCTT	CCGTCACAGG
2161	TATTTATTTCG	GCGCAAAGTG	CGTCGGGTGA	TGCTGCCAAC	TTAGTCGACT	ACAGGTCACT
2221	AATACCATCT	AAGTAGTTGA	TTCATAGTGA	CTGGATATGT	TGTGTTTTAC	AGTATTATGT
2281	AGTCTGTTTT	TTATGCAAAA	TCTAATTTAA	TATATTGATA	TTTATATCAT	TTTACGTTTC
2341	TCGTTTCAGCT	TTCTTGTACA	AAGTTGGCAT	TATAAGAAAG	CATTGCTTAT	CAATTTGTTG
2401	CAACGAACAG	GTCACATCA	GTCAAAATAA	AATCATTATT	TGCCATCCAG	CTGCAGCTCT
2461	GGCCCGTGTC	TCAAAATCTC	TGATGTTACA	TTGCACAAGA	TAAAAATATA	TCATCATGAA
2521	CAATAAAACT	GTCTGCTTAC	ATAAACAGTA	ATACAAGGGG	TGTTATGAGC	CATATTCAAC
2581	GGGAAACGTC	GAGGCCGCGA	TTAAATTCCA	ACATGGATGC	TGATTTATAT	GGGTATAAAT
2641	GGGCTCGCGA	TAATGTCGGG	CAATCAGGTG	CGACAATCTA	TCGCTTGTAT	GGGAAGCCCG
2701	ATGCGCCAGA	GTTGTTTCTG	AAACATGGCA	AAGGTAGCGT	TGCCAATGAT	GTTACAGATG
2761	AGATGGTCAG	ACTAACTGG	CTGACGGAAT	TTATGCCTCT	TCCGACCATC	AAGCATTTTA
2821	TCCGTACTCC	TGATGATGCA	TGGTTACTCA	CCACTGCGAT	CCCCGGAAAA	ACAGCATTCC
2881	AGGTATTAGA	AGAATATCCT	GATTCAGGTG	AAAATATTGT	TGATGCGCTG	GCAGTGTTCC
2941	TGCGCCGGTT	GCATTCGATT	CCTGTTTGTA	ATTGTCCTTT	TAACAGCGAT	CGCGTATTTT
3001	GTCTCGCTCA	GGCGCAATCA	CGAATGAATA	ACGGTTTGTT	TGATGCGAGT	GATTTTGATG
3061	ACGAGCGTAA	TGGCTGGCCT	GTTGAACAAG	TCTGGAAAGA	AATGCATAAA	CTTTTGCCAT
3121	TCTCACCGBA	TTCAGTCGTC	ACTCATGGTG	ATTTCTCACT	TGATAACCTT	ATTTTGTACG
3181	AGGGGAAATT	AATAGGTTGT	ATTGATGTTG	GACGAGTCGG	AATCGCAGAC	CGATACCAGG
3241	ATCTTGCCAT	CCTATGGAAC	TGCCTCGGTG	AGTTTTCTCC	TTCATTACAG	AAACGGCTTT
3301	TTCAAAAATA	TGGTATTGAT	AATCCTGATA	TGAATAAATT	GCAGTTTCAT	TTGATGCTCG
3361	ATGAGTTTTT	CTAATCAGAA	TTGGTTAATT	GGTTGTAACA	CTGGCAGAGC	ATTACGCTGA
3421	CTTGACGGGA	CGGCGCAAGC	TCATGACCAA	AATCCCTTAA	CGTGAGTTTT	CGTTCCACTG
3481	AGCGTCAGAC	CCCGTAGAAA	AGATCAAAGG	ATCTTCTTGA	GATCCTTTTT	TTCTGCGCGT
3541	AATCTGCTGC	TTGCAAACAA	AAAAACCACC	GCTACCAGCG	GTGGTTTGTT	TGCCGGATCA
3601	AGAGCTACCA	ACTCTTTTTC	CGAAGGTAAC	TGGCTTCAGC	AGAGCGCAGA	TACCAAATAC
3661	TGTCCTTCTA	GTGTAGCCGT	AGTTAGGCCA	CCACTTCAAG	AACTCTGTAG	CACCGCCTAC
3721	ATACCTCGCT	CTGCTAATCC	TGTTACCAGT	GGCTGCTGCC	AGTGGCGATA	AGTCGTGTCT
3781	TACCGGGTTG	GACTCAAGAC	GATAGTTACC	GGATAAGGCG	CAGCGGTCGG	GCTGAACGGG
3841	GGGTTTCGTGC	ACACAGCCCA	GCTTGGAGCG	AACGACCTAC	ACCGAACTGA	GATACCTACA
3901	GCGTGAGCTA	TGAGAAAGCG	CCACGCTTCC	CGAAGGGAGA	AAGGCGGACA	GGTATCCGGT
3961	AAGCGGCAGG	GTCGGAACAG	GAGAGCGCAC	GAGGGAGCTT	CCAGGGGGAA	ACGCCTGGTA
4021	TCTTTATAGT	CCTGTCGGGT	TTCGCCACCT	CTGACTTGAG	CGTCGATTTT	TGTGATGCTC
4081	GTCAGGGGGG	CGGAGCCTAT	GGAAAAACGC	CAGCAACGCG	GCCTTTTTAC	GGTTCCTGGC
4141	CTTTTGCTGG	CCTTTTGCTC	ACATGTTCTT	TCCTGCGTTA	TCCCCTGATT	CTGTGGATAA
4201	CCGTATTACC	GCTAGCCAGG	AAGAGTTTGT	AGAAACGCAA	AAAGGCCATC	CGTCAGGATG
4261	GCCTTCTGCT	TAGTTTGATG	CCTGGCAGTT	TATGGCGGGC	GTCCTGCCCG	CCACCCTCCG
4321	GGCCGTTGCT	TCACAACGTT	CAAATCCGCT	CCCGGCGGAT	TTGTCTTACT	CAGGAGAGCG
4381	TTACCGGACA	AACAACAGAT	AAAACGAAAG	GCCCAGTCTT	CCGACTGAGC	CTTTCGTTTT
4441	ATTTGATGCC	TGGCAGTTCC	CTACTCTCGC			

FIG.49C

pDONR202 (kanR)

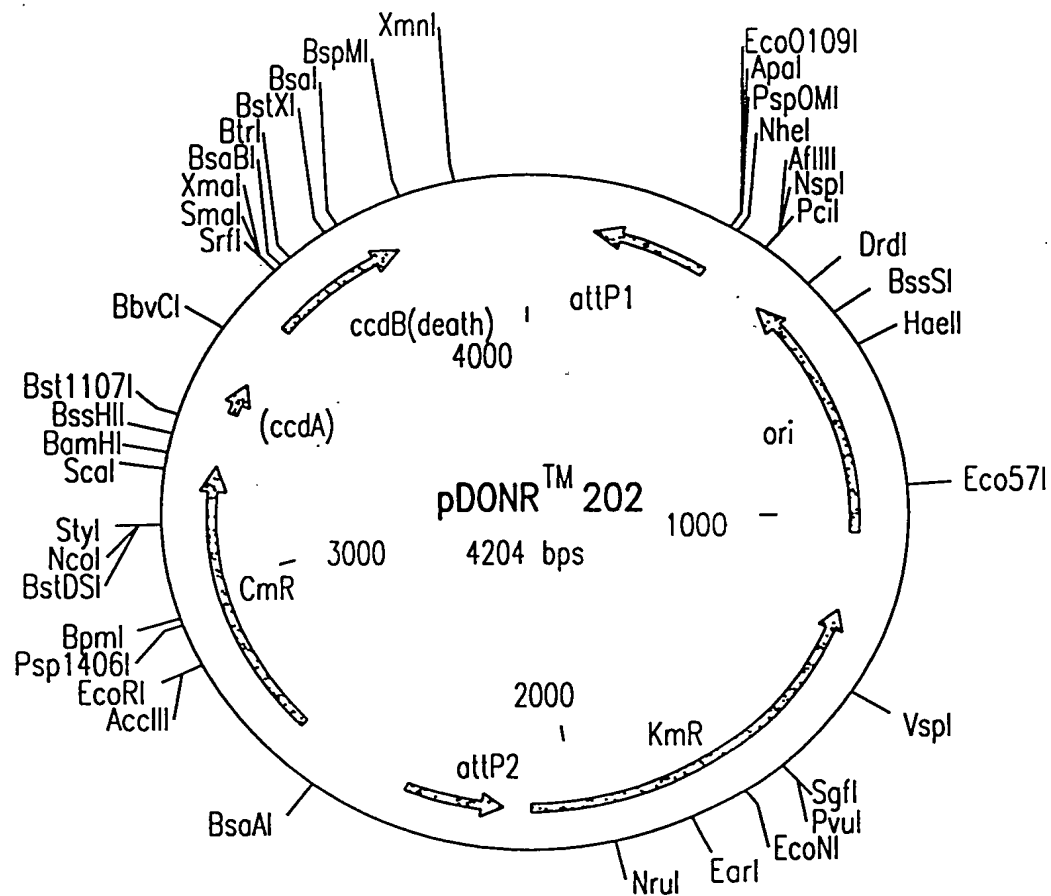


FIG.50A

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pDONR202 4204 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
369..127	attP1
486..1059	ori
1228..2107	KmR
2381..2140	attP2
2629..3288	CmR
3408..3492	inactivated ccdA
3630..3935	ccdB

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1 CGGCATTGAG GACAATAGCG AGTAGGCTGG ATACGACGAT TCCGTTTGAG AAGAACATTT
61 GGAAGGCTGT CGGTCGACTA AGTTGGCAGC ATCACCCGAA GAACATTTGG AAGGCTGTCTG
121 GTCGACTACA GGTCACATAAT ACCATCTAAG TAGTTGATTC ATAGTGACTG GATATGTTGT
181 GTTTTACAGT ATTATGTAGT CTGTTTTTTA TGCAAAATCT AATTTAATAT ATTGATATTT
241 ATATCATTTT ACGTTTCTCG TTCAGCTTTT TTGTACAAAG TTGGCATTAT AAAAAAGCAT
301 TGCTCATCAA TTTGTTGCAA CGAACAGGTC ACTATCAGTC AAAATAAAAT CATTATTTGG
361 GGCCCGAGAT CCATGCTAGC GGTAATACGG TTATCCACAG AATCAGGGGA TAACGCAGGA
421 AAGAACATGT GAGCAAAAGG CCAGCAAAAG GCCAGGAACC GTAAAAAGGC CGCGTTGCTG
481 GCGTTTTTCC ATAGGCTCCG CCCCCCTGAC GAGCATCACA AAAATCGACG CTCAAGTCAG
541 AGGTGGCGAA ACCCGACAGG ACTATAAAGA TACCAGGCGT TTCCCCCTGG AAGCTCCCTC
601 GTGCGCTCTC CTGTTCCGAC CCTGCCGCTT ACCGGATACC TGTCCGCCTT TCTCCCTTCG
661 GGAAGCGTGG CGCTTTCTCA TAGCTCACGC TGTAGGTATC TCAGTTCGGT GTAGGTCGTT
721 CGCTCCAAGC TGGGCTGTGT GCACGAACCC CCGTTTCAGC CCGACCGCTG CGCCTTATCC
781 GGTAACATATC GTCTTGAGTC CAACCCGGTA AGACACGACT TATCGCCACT GGCAGCAGCC
841 ACTGGTAACA GGATTAGCAG AGCGAGGTAT GTAGGCGGTG CTACAGAGTT CTTGAAGTGG
901 TGGCCTAACT ACGGCTACAC TAGAAGGACA GTATTTGGTA TCTGCGCTCT GCTGAAGCCA
961 GTTACCTTCG GAAAAAGAGT TGGTAGCTCT TGATCCGGCA AACAAACCAC CGCTGGTAGC
1021 GGTGGTTTTT TTGTTTGCAA GCAGCAGATT ACGCGCAGAA AAAAAGGATC TCAAGAAGAT
1081 CCTTTGATCT TTTCTACGGG GTCTGACGCT CAGTGGAACG AAAACTCACG TTAAGGGATT
1141 TTGGTCATGA GCTTGCGCCG TCCCGTCAAG TCAGCGTAAT GCTCTGCCAG TGTTACAACC
1201 AATTAACCAA TTCTGATTAG AAAAATCAT CGAGCATCAA ATGAAACTGC AATTTATTCA
1261 TATCAGGATT ATCAATACCA TATTTTGTAA AAAGCCGTTT CTGTAATGAA GGAGAAAAC
1321 CACCGAGGCA GTTCCATAGG ATGGCAAGAT CCTGGTATCG GTCTGCGATT CCGACTCGTC
1381 CAACATCAAT ACAACCTATT AATTTCCCTT CGTCAAAAAT AAGGTTATCA AGTGAGAAAT
1441 CACCATGAGT GACGACTGAA TCCGGTGAGA ATGGCAAAAG TTTATGCATT TCTTTCCAGA
1501 CTTGTTCAAC AGGCCAGCCA TTACGCTCGT CATCAAAATC ACTCGCATCA ACCAAACCGT
1561 TATTCATTCTG TGATTGCGCC TGAGCGAGAC GAAATACGCG ATCGCTGTTA AAAGGACAAT
1621 TACAAACAGG AATCGAATGC AACC GGCGCA GGAACACTGC CAGCGCATCA ACAATATTTT
1681 CACCTGAATC AGGATATTCT TCTAATACCT GGAATGCTGT TTTTCCGGGG ATCGCAGTGG

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FIG.50B

1741 TGAGTAACCA TGCATCATCA GGAGTACGGA TAAAATGCTT GATGGTCGGA AGAGGCATAA
 1801 ATTCCGTCAG CCAGTTTAGT CTGACCATCT CATCTGTAAC ATCATTGGCA ACGCTACCTT
 1861 TGCCATGTTT CAGAAACAAC TCTGGCGCAT CGGGCTTCCC ATACAAGCGA TAGATTGTCTG
 1921 CACCTGATTG CCCGACATTA TCGCGAGCCC ATTTATACCC ATATAAATCA GCATCCATGT
 1981 TGGAATTTAA TCGCGGCCCTC GACGTTTCCC GTTGAATATG GCTCATAACA CCCCTTGTAT
 2041 TACTGTTTAT GTAAGCAGAC AGTTTTATTG TTCATGATGA TATATTTTGA TCTTGTGCAA
 2101 TGTAACATCA GAGATTTTGA GACACGGGCC AGAGCTGCAG CTGGATGGCA AATAATGATT
 2161 TTATTTTGAC TGATAGTGAC CTGTTTCGTTG CAACAAATTG ATAAGCAATG CTTTCTTATA
 2221 ATGCCAACTT TGTACAAGAA AGCTGAACGA GAAACGTAAA ATGATATAAA TATCAATATA
 2281 TTAAATTAGA TTTTGCATAA AAAACAGACT ACATAATACT GTAAAACACA ACATATCCAG
 2341 TCACTATGAA TCAACTACTT AGATGGTATT AGTGACCTGT AGTCGACTAA GTTGGCAGCA
 2401 TCACCCGACG CACTTTGCGC CGAATAAATA CCTGTGACGG AAGATCACTT CGCAGAATAA
 2461 ATAAATCCTG GTGTCCCTGT TGATACCGGG AAGCCCTGGG CCAACTTTTG GCGAAAATGA
 2521 GACGTTGATC GGCACGTAAG AGGTTCCAAC TTTCACCATA ATGAAATAAG ATCACTACCG
 2581 GCGGTATTTT TTGAGTTATC GAGATTTTCA GGAGCTAAGG AAGCTAAAAT GGAGAAAAAA
 2641 ATCACTGGAT ATACCACCGT TGATATATCC CAATGGCATC GTAAAGAACA TTTTGAGGCA
 2701 TTTCAGTCAG TTGCTCAATG TACCTATAAC CAGACCGTTC AGCTGGATAT TACGGCCTTT
 2761 TTAAAGACCG TAAAGAAAAA TAAGCACAAG TTTTATCCGG CCTTTATTCA CATTCTTGCC
 2821 CGCCTGATGA ATGCTCATCC GGAATTCCGT ATGGCAATGA AAGACGGTGA GCTGGTGATA
 2881 TGGGATAGTG TTCACCCTTG TTACACCGTT TTCCATGAGC AAAGTGAAC GTTTTCATCG
 2941 CTCTGGAGTG AATACCACGA CGATTTCCGG CAGTTTCTAC ACATATATTC GCAAGATGTG
 3001 GCGTGTTACG GTGAAAACCT GGCCTATTTT CCTAAAGGGT TTATTGAGAA TATGTTTTTC
 3061 GTCTCAGCCA ATCCCTGGGT GAGTTTCACC AGTTTTGATT TAAACGTGGC CAATATGGAC
 3121 AACTTCTTCG CCCCCGTTTT CACCATGGGC AAATATTATA CGCAAGGCGA CAAGGTGCTG
 3181 ATGCCGCTGG CGATTCAGGT TCATCATGCC GTCTGTGATG GCTTCCATGT CGGCAGAATG
 3241 CTTAATGAAT TACAACAGTA CTGCGATGAG TGGCAGGGCG GGGCGTAATC GCGTGGATCC
 3301 GGCTTACTAA AAGCCAGATA ACAGTATGCG TATTTGCGCG CTGATTTTTG CGGTATAAGA
 3361 ATATATACTG ATATGTATAC CCGAAGTATG TCAAAAAGAG GTGTGCTATG AAGCAGCGTA
 3421 TTACAGTGAC AGTTGACAGC GACAGCTATC AGTTGCTCAA GGCATATATG ATGTCAATAT
 3481 CTCCGGTCTG GTAAGCACAA CCATGCAGAA TGAAGCCCGT CGTCTGCGTG CCGAACGCTG
 3541 GAAAGCGGAA AATCAGGAAG GGATGGCTGA GGTGCCCCGG TTTATTGAAA TGAACGGCTC
 3601 TTTTGCTGAC GAGAACAGGG ACTGGTGAAA TGCAGTTTAA GGTTTACACC TATAAAAGAG
 3661 AGAGCCGTTA TCGTCTGTTT GTGGATGTAC AGAGTGATAT TATTGACACG CCCGGGCGAC
 3721 GGATGGTGAT CCCCCTGGCC AGTGCACGTC TGCTGTCAGA TAAAGTCTCC CGTGAACTTT
 3781 ACCCGGTGGT GCATATCGGG GATGAAAGCT GGCATGATG GACCACCGAT ATGGCCAGTG
 3841 TGCCGGTCTC CGTTATCGGG GAAGAAGTGG CTGATCTCAG CCACCGCGAA AATGACATCA
 3901 AAAACGCCAT TAACCTGATG TTCTGGGGAA TATAAATGTC AGGCTCCCTT ATACACAGCC
 3961 AGTCTGCAGG TCGATACAGT AGAAATTACA GAAACTTTAT CACGTTTAGT AAGTATAGAG
 4021 GCTGAAAATC CAGATGAAGC CGAACGACTT GTAAGAGAAA AGTATAAGAG TTGTGAAATT
 4081 GTTCTTGATG CAGATGATTT TCAGGACTAT GACACTAGCG TATATGAATA GGTAGATGTT
 4141 TTTATTTTGT CACACAAAAA AGAGGCTCGC ACCTCTTTTT CTTATTTCTT TTTATGATTT
 4201 AATA

FIG.50C

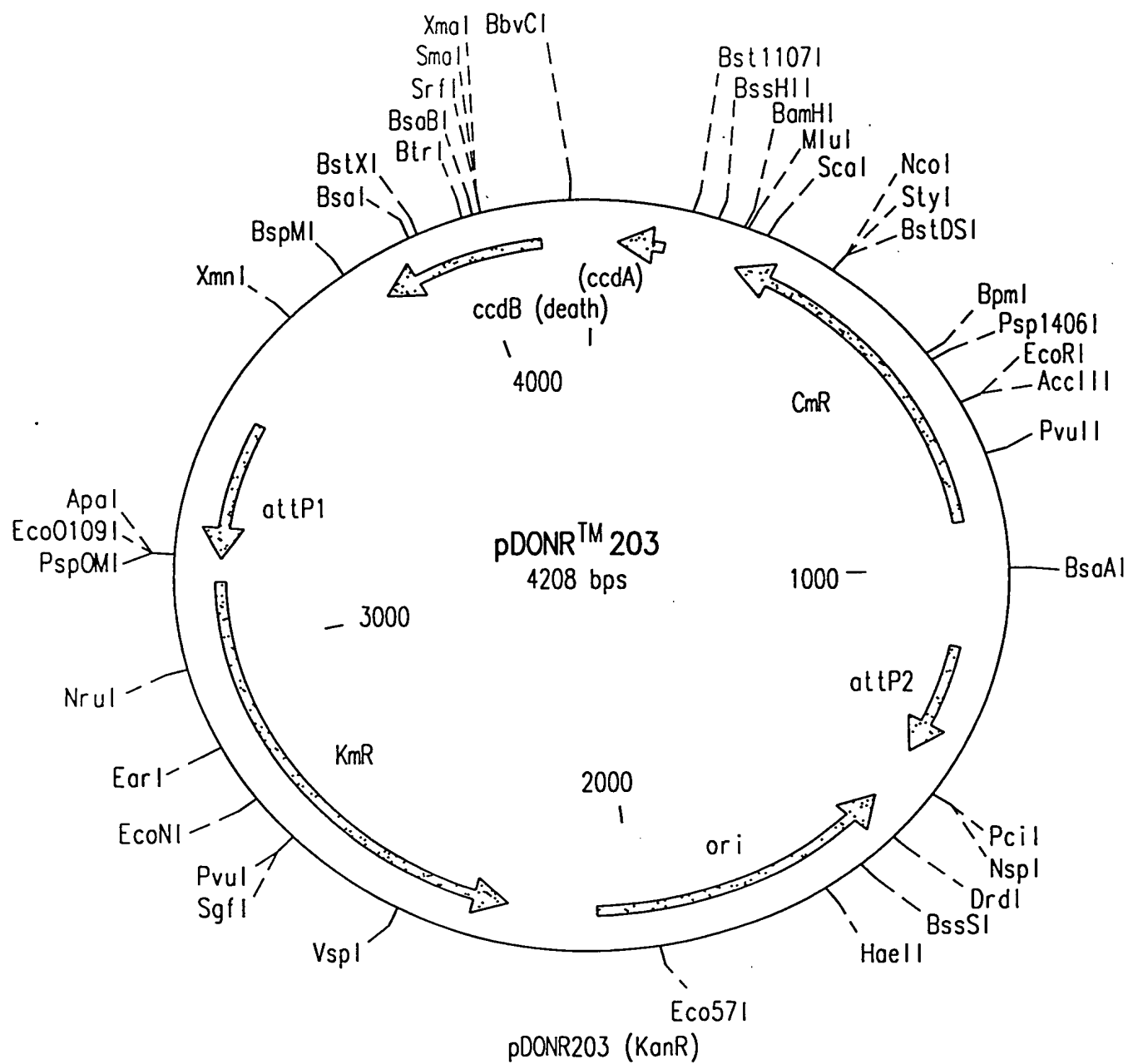


FIG.51A

162/253

pDONR203 4208 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
47..131	inactivated ccdA
251..910	CmR
1158..1398	attP2
1509..2082	ori
2251..3130	KmR
3464..3174	attP1
3812..4117	ccdB

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1  GCGTTCGGCA CGCAGACGAC GGGCTTCATT CTGCATGGTT GTGCTTACCA GACCGGAGAT
61 ATTGACATCA TATATGCCTT GAGCAACTGA TAGCTGTCGC TGTCAACTGT CACTGTAATA
121 CGCTGCTTCA TAGCACACCT CTTTTTGACA TACTTCGGGT ATACATATCA GTATATATTC
181 TTATACCGCA AAAATCAGCG CGCAAATACG CATACTGTTA TCTGGCTTTT AGTAAGCCGG
241 ATCCACGCGT TTACGCCCCG CCCTGCCACT CATCGCAGTA CTGTTGTAAT TCATTAAGCA
301 TTCTGCCGAC ATGGAAGCCA TCACAGACGG CATGATGAAC CTGAATCGCC AGCGGCATCA
361 GCACCTTGTC GCCTTGCGTA TAATATTTGC CCATGGTGAA AACGGGGGCG AAGAAGTTGT
421 CCATATTGGC CACGTTTAAA TCAAACTGG TGAAACTCAC CCAGGGATTG GCTGAGACGA
481 AAAACATATT CTCAATAAAC CCTTTAGGGA AATAGGCCAG GTTTTCACCG TAACACGCCA
541 CATCTTGCGA ATATATGTGT AGAACTGCC GGAAATCGTC GTGGTATTCA CTCCAGAGCG
601 ATGAAAACGT TTCAGTTTGC TCATGGAAAA CGGTGTAACA AGGGTGAACA CTATCCATA
661 TCACCAGCTC ACCGTCTTTC ATTGCCATAC GGAATTCCGG ATGAGCATTG ATCAGGCGGG
721 CAAGAATGTG AATAAAGGCC GGATAAACT TGTGCTTATT TTTCTTTACG GTCTTTAAAA
781 AGGCCGTAAT ATCCAGCTGA ACGGTCTGGT TATAGGTACA TTGAGCAACT GACTGAAATG
841 CCTCAAAATG TTCTTTACGA TGCCATTGGG ATATATCAAC GGTGGTATAT CCAGTGATTT
901 TTTTCTCCAT TTTAGCTTCC TTAGCTCCTG AAAATCTCGA TAACTCAAAA AATACGCCCG
961 GTAGTGATCT TATTTTATTA TGGTGAAAGT TGGAACCTCT TACGTGCCGA TCAACGTCTC
1021 ATTTTCGCCA AAAGTTGGCC CAGGGCTTCC CGGTATCAAC AGGGACACCA GGATTTATTT
1081 ATTCTGCGAA GTGATCTTCC GTCACAGGTA TTTATTCGGC GCAAAGTGCG TCGGGTGATG
1141 CTGCCAACTT AGTCGACTAC AGGTCACTAA TACCATCTAA GTAGTTGATT CATAGTGACT
1201 GGATATGTTG TGTTTTACAG TATTATGTAG TCTGTTTTTT ATGCAAAATC TAATTTAATA
1261 TATTGATATT TATATCATTT TACGTTTCTC GTTCAGCTTT CTTGTACAAA GTTGGCATTG
1321 TAAGAAAGCA TTGCTTATCA ATTTGTTGCA ACGAACAGGT CACTATCAGT CAAAATAAAA
1381 TCATTATTTG CCATCCAGCT AGCGGTAATA CGGTTATCCA CAGAATCAGG GGATAACGCA
1441 GGAAAGAACA TGTGAGCAAA AGGCCAGCAA AAGGCCAGGA ACCGTAAAAA GGCCGCGTTG
1501 CTGGCGTTTT TCCATAGGCT CCGCCCCCT GACGAGCATC AAAAAATCG ACGCTCAAGT
1561 CAGAGGTGGC GAAACCCGAC AGGACTATAA AGATACCAGG CGTTTCCCCC TGGAAGCTCC
1621 CTCGTGCGCT CTCCTGTTCC GACCCTGCCG CTTACCGGAT ACCTGTCCGC CTTTCTCCCT
1681 TCGGGAAGCG TGGCGCTTTC TCATAGCTCA CGCTGTAGGT ATCTCAGTTC GGTGTAGGTC
1741 GTTCGCTCCA AGCTGGGCTG TGTGCACGAA CCCCCGTTT AGCCCGACCG CTGCGCCTTA
1801 TCCGGTAACT ATCGTCTTGA GTCCAACCCG GTAAGACACG ACTTATCGCC ACTGGCAGCA
1861 GCCACTGGTA ACAGGATTAG CAGAGCGAGG TATGTAGGCG GTGCTACAGA GTTCTTGAAG
1921 TGGTGGCCTA ACTACGGCTA CACTAGAAGA ACAGTATTTG GTATCTGCGC TCTGCTGAAG

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FIG.51B

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1981	CCAGTTACCT	TCGGAAAAAG	AGTTGGTAGC	TCTTGATCCG	GCAAACAAAC	CACCGCTGGT
2041	AGCGGTGGTT	TTTTTGTTTG	CAAGCAGCAG	ATTACGCGCA	GAAAAAAGG	ATCTCAAGAA
2101	GATCCTTTGA	TCTTTTCTAC	GGGGTCTGAC	GCTCAGTGGA	ACGAAAACCTC	ACGTTAAGGG
2161	ATTTTGGTCA	TGAGCTTGCG	CCGTCCCGTC	AAGTCAGCGT	AATGCTCTGC	CAGTGTTACA
2221	ACCAATTAAC	CAATTCTGAT	TAGAAAAACT	CATCGAGCAT	CAAATGAAAC	TGCAATTTAT
2281	TCATATCAGG	ATTATCAATA	CCATATTTTT	GAAAAAGCCG	TTTCTGTAAT	GAAGGAGAAA
2341	ACTCACCGAG	GCAGTTCCAT	AGGATGGCAA	GATCCTGGTA	TCGGTCTGCG	ATTCCGACTC
2401	GTCCAACATC	AATACAACCT	ATTAATTTCC	CCTCGTCAAA	AATAAGGTTA	TCAAGTGAGA
2461	AATCACCATG	AGTGACGACT	GAATCCGGTG	AGAATGGCAA	AAGTTTATGC	ATTTCTTTCC
2521	AGACTTGTTT	AACAGGCCAG	CCATTACGCT	CGTCATCAAA	ATCACTCGCA	TCAACCAAAC
2581	CGTTATTCAT	TCGTGATTGC	GCCTGAGCGA	GACGAAATAC	GCGATCGCTG	TTAAAAGGAC
2641	AATTACAAAC	AGGAATCGAA	TGCAACCGGC	GCAGGAACAC	TGCCAGCGCA	TCAACAATAT
2701	TTTCACCTGA	ATCAGGATAT	TCTTCTAATA	CCTGGAATGC	TGTTTTTCCG	GGGATCGCAG
2761	TGGTGAGTAA	CCATGCATCA	TCAGGAGTAC	GGATAAAATG	CTTGATGGTC	GGAAGAGGCA
2821	TAAATTCCGT	CAGCCAGTTT	AGTCTGACCA	TCTCATCTGT	AACATCATTG	GCAACGCTAC
2881	CTTTGCCATG	TTTCAGAAAC	AACTCTGGCG	CATCGGGCTT	CCCATAACAAG	CGATAGATTG
2941	TCGCACCTGA	TTGCCCCGACA	TTATCGCGAG	CCCATTTATA	CCCATATAAA	TCAGCATCCA
3001	TGTTGGAATT	TAATCGCGGC	CTCGACGTTT	CCCGTTGAAT	ATGGCTCATA	ACACCCCTTG
3061	TATTACTGTT	TATGTAAGCA	GACAGTTTTA	TTGTTCATGA	TGATATATTT	TTATCTTGTG
3121	CAATGTAACA	TCAGAGATTT	TGAGACACGG	GCCAGAGCTG	CAGCTAGCAT	GGATCTCGGG
3181	CCCCAAATAA	TGATTTTATT	TTGACTGATA	GTGACCTGTT	CGTTGCAACA	AATTGATGAG
3241	CAATGCTTTT	TTATAATGCC	AACTTTGTAC	AAAAAAGCTG	AACGAGAAAC	GTAAAATGAT
3301	ATAAATATCA	ATATATTAAT	TTAGATTTTG	CATAAAAAAC	AGACTACATA	ATACTGTAAA
3361	ACACAACATA	TCCAGTCACT	ATGAATCAAC	TACTTAGATG	GTATTAGTGA	CCTGTAGTCG
3421	ACCGACAGCC	TTCCAAATGT	TCTTCGGGTG	ATGCTGCCAA	CTTAGTCGAC	CGACAGCCTT
3481	CCAAATGTTT	TTCTCAAACG	GAATCGTCGT	ATCCAGCCTA	CTCGCTATTG	TCCTCAATGC
3541	CGTATTAAAT	CATAAAAAGA	AATAAGAAAA	AGAGGTGCGA	GCCTCTTTTT	TGTGTGACAA
3601	AATAAAAACA	TCTACCTATT	CATATACGCT	AGTGTCTATG	TCCTGAAAAT	CATCTGCATC
3661	AAGAACAATT	TCACAACCTT	TATACTTTTC	TCTTACAAGT	CGTTCGGCTT	CATCTGGATT
3721	TTCAGCCTCT	ATACTTACTA	AACGTGATAA	AGTTTCTGTA	ATTTCTACTG	TATCGACCTG
3781	CAGACTGGCT	GTGTATAAGG	GAGCCTGACA	TTTATATTCC	CCAGAACATC	AGGTTAATGG
3841	CGTTTTTGAT	GTCATTTTCG	CGGTGGCTGA	GATCAGCCAC	TTCTTCCCCG	ATAACGGAGA
3901	CCGGCACACT	GGCCATATCG	GTGGTCATCA	TGCGCCAGCT	TTCATCCCCG	ATATGCACCA
3961	CCGGGTAAAG	TTCACGGGAG	ACTTTATCTG	ACAGCAGACG	TGCACTGGCC	AGGGGGATCA
4021	CCATCCGTCG	CCCGGGCGTG	TCAATAATAT	CACTCTGTAC	ATCCACAAAC	AGACGATAAC
4081	GGCTCTCTCT	TTTATAGGTG	TAAACCTTAA	ACTGCATTTT	ACCAGTCCCT	GTTCTCGTCA
4141	GCAAAAGAGC	CGTTCATTTT	AATAAACCGG	GCGACCTCAG	CCATCCCTTC	CTGATTTTCC
4201	GCTTTCCA					

FIG.51C

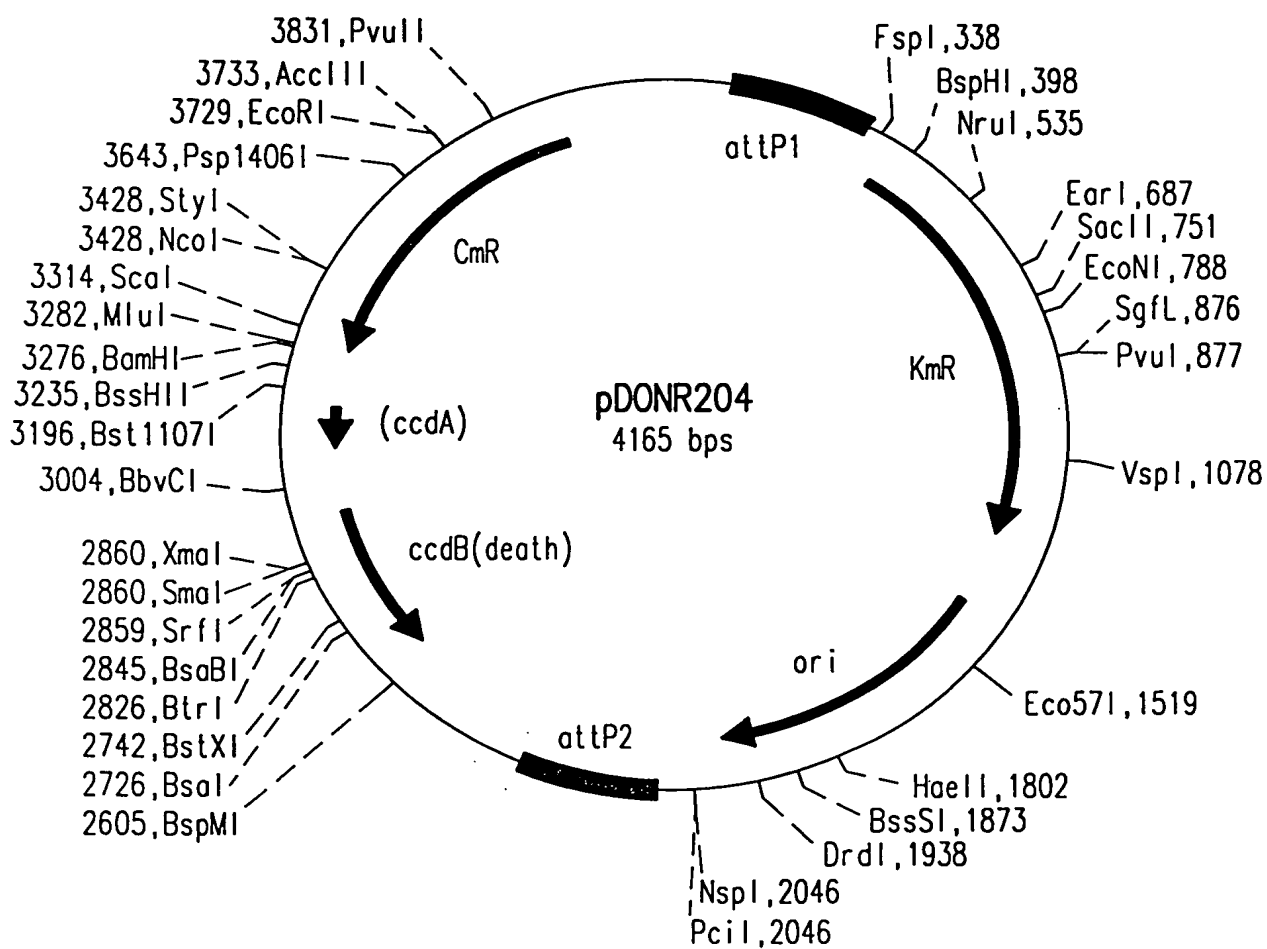


FIG.52A

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pDONR204 4165 bp

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1  CGGCATTGAG GACAATAGCG AGTAGGCTGG ATACGACGAT TCCGTTTGAG AAGAACATTT
61  GGAAGGCTGT CGGTCGACTA CAGGTCACTA ATACCATCTA AGTAGTTGAA TCATAGTGAC
121 TGGATATGTT GTGTTTTACA GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT
181 ATATTGATAT TTATATCATT TTACGTTTCT CGTTCAGCTT TTTTGTACAA AGTTGGCATT
241 ATAAAAAAGC ATTGCTTATC AATTGTGTC AACGAACAGG TCACTATCAG TCAAAATAAA
301 ATCATTATTT GGGGCCCGAG ATCCATGCTA GCTGCAGTGC GCAGGGCCCG TGTCTCAAAA
361 TCTCTGATGT TACATTGCAC AAGATAAAAA TATATCATCA TGAACAATAA AACTGTCTGC
421 TTACATAAAC AGTAATACAA GGGGTGTTAT GAGCCATATT CAACGGGAAA CGTCTTGCTG
481 GAGGCCGCGA TTAAATTCCA ACATGGATGC TGATTTATAT GGGTATAAAT GGGCTCGCGA
541 TAATGTCGGG CAATCAGGTG CGACAATCTT TCGATTGTAT GGAAGCCCG ATGCGCCAGA
601 GTTGTCTCTG AACATGGCA AAGGTAGCGT TGCCAATGAT GTTACAGATG AGATGGTCAG
661 ACTAACTGG CTGACGGAAT TTATGCCTCT TCCGACCATC AAGCATTTTA TCCGTA CTCC
721 TGATGATGCA TGGTTACTCA CCACTGCGAT CCGCGGGAAA ACAGCATTCC AGGTATTAGA
781 AGAATATCCT GATTCAGGTG AAAATATTGT TGATGCGCTG GCAGTGTTCC TGCGCCGGTT
841 GCATTCGATT CCTGTTTGTA ATTGTCCTTT TAACAGCGAT CGCGTATTTC GTCTCGCTCA
901 GGCGCAATCA CGAATGAATA ACGGTTTGGT TGATGCGAGT GATTTTGATG ACGAGCGTAA
961 TGGCTGGCCT GTTGAACAAG TCTGGAAAGA AATGCATACG CTTTTGCCAT TCTCACCGGA
1021 TTCAGTCGTC ACTCATGGTG ATTTCTCACT TGATAACCTT ATTTTGTACG AGGGGAAATT
1081 AATAGGTTGT ATTGATGTTG GACGAGTCGG AATCGCAGAC CGATACCAGG ATCTTGCCAT
1141 CCTATGGAAC TGCCTCGGTG AGTTTTCTCC TTCATTACAG AAACGGCTTT TTCAAAAATA
1201 TGGTATTGAT AATCCTGATA TGAATAAATT GCAGTTTCAT TTGATGCTCG ATGAGTTTTT
1261 CTAATCAGAA TTGGTTAATT GGTGTGAACA CTGGCAGAGC ATTACGCTGA CTTGACGGGA
1321 CGGCGNCATG ACCAAAATCC CTTAACGTGA GTTTTCGTTT CACTGAGCGT CAGACCCCGT
1381 AGAAAAGATC AAAGGATCTT CTTGAGATCC TTTTTTCTG CGCGTAATCT GCTGCTTGCA
1441 AACAAAAAAA CCACCGCTAC CAGCGGTGGT TTGTTTGCCG GATCAAGAGC TACCAACTCT
1501 TTTTCCGAAG GTAACGGCT TCAGCAGAGC GCAGATACCA AATACTGTCC TTCTAGTGTA
1561 GCCGTAGTTA GGCCACCACT TCAAGAACTC TGTAGCACCG CCTACATACC TCGCTCTGCT
1621 AATCCTGTTA CCAGTGGCTG CTGCCAGTGG CGATAAGTCG TGTCTTACCG GGTGACTC
1681 AAGACGATAG TTACCGGATA AGGCGCAGCG GTCGGGCTGA ACGGGGGGTT CGTGACACA
1741 GCCCAGCTTG GAGCGAACGA CCTACACCGA ACTGAGATAC CTACAGCGTG AGCTATGAGA
1801 AAGCGCCACG CTTCCCGAAG GGAGAAAGGC GGACAGGTAT CCGGTAAGCG GCAGGGTCGG
1861 AACAGGAGAG CGCACGAGGG AGCTTCCAGG GGGAAACGCC TGGTATCTTT ATAGTCCTGT
1921 CGGGTTTCGC CACCTCTGAC TTGAGCGTCG ATTTTGTGA TGCTCGTCAG GGGGGCGGAG
1981 CCTATGGAAG AACGCCAGCA ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT
2041 TGCTCACATG TTCTTTCCTG CGTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCTAG
2101 CTGGATCGGC AAATAATGAT TTTATTTTGA CTGATAGTGA CCTGTTCGTT GCAACAAATT
2161 GATAAGCAAT GCTTTTTTAT AATGCCAACT TTGTACAAGA AAGCTGAACG AGAAACGTAA
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FIG.52B

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2221 AATGATATAA ATATCAATAT ATTA AATTAG ATTTTGCATA AAAACAGAC TACATAATAC
2281 TGTA AACAC AACATATCCA GTC ACTATGA TTCA ACTACT TAGATGGTAT TAGTGACCTG
2341 TAGTCGACTA AGTTGGCAGC ATC ACCCGAC GCACTTTGCG CCGAATAAAT ACCTGTGACG
2401 GAAGATCACT TCGCAGAATA AATAAATCCT GGTGTCCCTG TTGATACCGG GAAGCCCTGG
2461 GCCAACTTTT GGC GAAAATG AGACGTTGAT CGGCACATTT CACA ACTCTT ATACTTTTCT
2521 CTTACAAGTC GTTCGGCTTC ATCTGGATTT TCAGCCTCTA TACTTACTAA ACGTGATAAA
2581 GTTTCTGTAA TTTCTACTGT ATCGACCTGC AGACTGGCTG TGTATAACGG AGCCTGACAT
2641 TTATATTCCC CAGAACATCA GGTTAATGGC GTTTTGTATG TCATTTTCGC GGTGGCTGAG
2701 ATCAGCCACT TCTTCCCCGA TAACGGAGAC CGGCACACTG GCCATATCGG TGGTCATCAT
2761 GCGCCAGCTT TCATCCCCGA TATGCACCAC CGGGTAAAGT TCACGGGAGA CTTTATCTGA
2821 CAGCAGACGT GCACTGGCCA GGGGGATCAC CATCCGTCGC CCGGGCGTGT CAATAATATC
2881 ACTCTGTACA TCCACAAACA GACGATAACG GCTCTCTCTT TTATAGGTGT AAACCTTAAA
2941 CTGCATTTCA CCAGTCCCTG TTCTCGTCAG CAAAAGAGCC GTTCATTTCA ATAAACCGGG
3001 CGACCTCAGC CATCCCTTCC TGATTTTCCG CTTTCCAGCG TTCGGCACGC AGACGACGGG
3061 CTTCAATTCTG CATGGTTGTG CTTACCAGAC CGGAGATATT GACATCATAT ATGCCTTGAG
3121 CAACTGATAG CTGTCGCTGT CAACTGTCAC TGTAATACGC TGCTTCATAG CACACCTCTT
3181 TTTGACATAC TTCGGGTATA CATATCAGTA TATATTCTTA TACCGCAAAA ATCAGCGCGC
3241 AAATACGCAT ACTGTTATCT GGCTTTTAGT AAGCCGGATC CACGCGTTTA CGCCCCGCC
3301 TGCCACTCAT CGCAGTACTG TTGTAATTCA TTAAGCATTC TGCCGACATG GAAGCCATCA
3361 CAGACGGCAT GATGAACCTG AATCGCCAGC GGCATCAGCA CCTTGTCCGC TTGCGTATAA
3421 TATTTGCCCA TGGTGAAAAC GGGGGCGAAG AAGTTGTCCA TATTGGCCAC GTTTAAATCA
3481 AAAGTGGTGA AACTCACCCA GGGATTGGCT GAGACGAAAA ACATATTCTC AATAAACCTT
3541 TTAGGGAAAT AGGCCAGGT TTCACCGTAA CACGCCACAT CTTGCGAATA TATGTGTAGA
3601 AACTGCCGGA AATCGTCGTG GTATTCACTC CAGAGCGATG AAAACGTTTC AGTTTGCTCA
3661 TGGAAAACGG TGTAACAAGG GTGAACACTA TCCCATATCA CCAGCTCACC GTCTTTCATT
3721 GCCATACGGA ATTCCGGATG AGCATTATC AGGCGGGCAA GAATGTGAAT AAAGGCCGGA
3781 TAAACTTGT GCTTATTTTT CTTTACGGTC TTTAAAAAGG CCGTAATATC CAGCTGAACG
3841 GTCTGGTTAT AGGTACATTG AGCAACTGAC TGAAATGCCT CAAAATGTTC TTTACGATGC
3901 CATTGGGATA TATCAACGGT GGTATATCCA GTGATTTTTT TCTCCATTTT AGCTTCCTTA
3961 GCTCCTGAAA ATCTCGATAA CTCAAAAAAT ACGCCCGGTA GTGATCTTAT TTCATTATGG
4021 TGAAAGTTGG AACCTCTTAC TGTTCTTGAT GCAGATGATT TTCAGGACTA TGACACTAGC
4081 ATATATGAAT AGGTAGATGT TTTTATTTTG TCACACAAAA AAGAGGCTCG CACCTCTTTT
4141 TCTTATTCT TTTTATGATT TAATA

FIG.52C

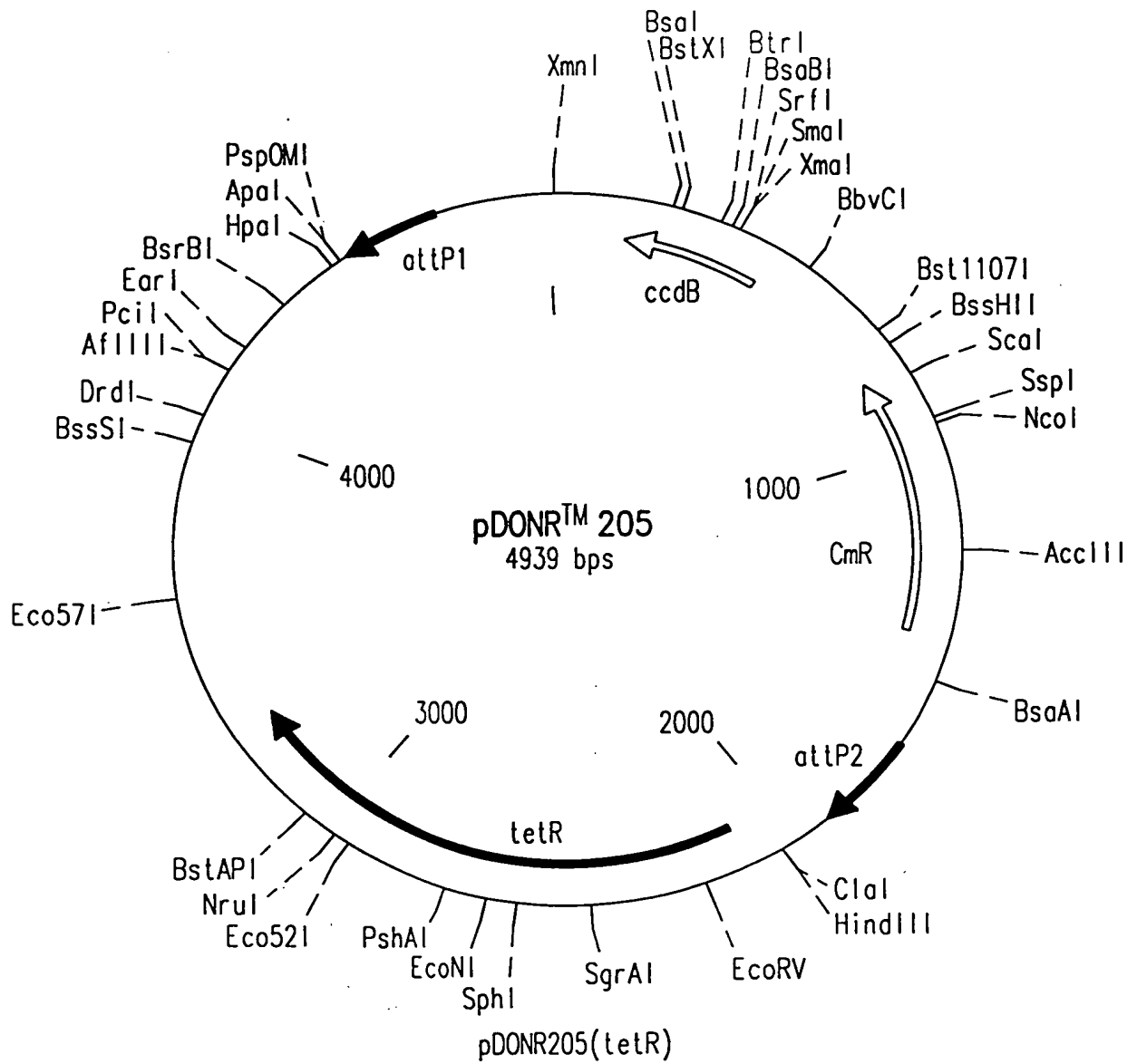


FIG.53A

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pDONR205 4939 bp

GGCATCAGCACCTTGTCGCCTTGCGTATAATATTTGCCCATGGTGAAAACGGGGGCGAAG
AAGTTGTCCATATTGGCCACGTTTAAATCAAACTGGTGAACTCACCCAGGGATTGGCT
GAGACGAAAAACATATTCTCAATAAACCTTTAGGGAAATAGGCCAGGTTTTACCGTAA
CACGCCACATCTTGCGAATATATGTGTAGAACTGCCGGAAATCGTCGTGGTATTCCTC
CAGAGCGATGAAAACGTTTCAGTTTGCTCATGGAAAACGGTGTAACAAGGGTGAACACTA
TCCCATATCACCGCTCACCGCTTTTCATTGCCATACGGAATTCGGATGAGCATTTCATC
AGGCGGGCAAGAATGTGAATAAAGGCCGATAAACTTGTGCTTATTTTTCTTACGGTC
TTTAAAAAGGCCGTAATATCCAGCTGAACGGTCTGGTTATAGGTACATTGAGCAACTGAC
TGAAATGCCTCAAAATGTTCTTACGATGCCATTGGGATATATCAACGGTGGTATATCCA
GTGATTTTTTTCTCCATTTTAGCTTCCTTAGCTCCTGAAAATCTCGATAACTCAAAAAAT
ACGCCCGGTAGTGATCTTATTTTATTATGGTGAAAGTTGGAACCTCTTACGTGCCGATCA
ACGTCTCATTTTTCGCCAAAAGTTGGCCAGGGCTTCCCGGTATCAACAGGGACACCAGGA
TTTATTTATTCTGCGAAGTGATCTTCCGTACAGGTATTTATTCGGCGCAAAGTGCGTCG
GGTGATGCTGCCAACTTAGTCGACTACAGGTCACTAATACCATCTAAGTAGTTGATTCAT
AGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTATGCAAAATCTAA
TTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTCAGCTTTCTTGTACAAAGTT
GGCATTATAAGAAAGCATTGCTTATCAATTTGTTGCAACGAACAGGTCACTATCAGTCAA
AATAAAATCATTATTTGCCATCCAGCTGCAGCTCTGGCCCGTGTCTCAAAATCTCTGATG
TTACATTGCACAAGATAAAAATATATCATCATGAATTCTCATGTTTGACAGCTTATCATC
GATAAGCTTTAATGCGGTAGTTTATCACAGTTAAATTGCTAACGCAGTCAGGCACCGTGT
ATGAAATCTAACAATGCGCTCATCGTCATCCTCGGCACCGTCACCCTGGATGCTGTAGGC
ATAGGCTTGGTTATGCCGGTACTGCCGGCCTCTTGCGGGATATCGTCCATTCCGACAGC
ATCGCCAGTCACTATGGCGTGCTGCTAGCGCTATATGCGTTGATGCAATTTCTATGCGCA
CCCGTTCTCGGAGCACTGTCCGACCGCTTTGGCCGCCGCCAGTCCTGCTCGCTTCGCTA
CTTGGAGCCACTATCGACTACGCGATCATGGCGACCACACCCGTCCTGTGGATCCTCTAC
GCCGGACGCATCGTGGCCGGCATCACCGGCGCCACAGGTGCGGTTGCTGGCGCCTATATC
GCCGACATCACCGATGGGGAAGATCGGGCTCGCCACTTCGGGCTCATGAGCGCTTGTTTC
GGCGTGGGTATGGTGGCAGGCCCGTGGCCGGGGGACTGTTGGGCGCCATCTCCTTGCAT
GCACCATTCCTTGCGGCGGCGGTGCTCAACGGCCTCAACCTACTACTGGGCTGCTTCCTA
ATGCAGGAGTCGCATAAGGGAGAGCGTCGACCGATGCCCTTGAGAGCCTTCAACCCAGTC
AGCTCCTTCCGGTGGGCGCGGGGCATGACTATCGTCGCCGCACTTATGACTGTCTTCTTT
ATCATGCAACTCGTAGGACAGGTGCCGGCAGCGCTCTGGGTCATTTTCGGCGAGGACCGC
TTTCGCTGGAGCGCGACGATGATCGGCCTGTGCTTGGCGTATTCGGAATCTTGCACGCC
CTCGCTCAAGCCTTCGTCACTGGTCCCGCCACCAAACGTTTCGGCGAGAAGCAGGCCATT
ATCGCCGGCATGGCGGCCGACGCGCTGGGCTACGTCTTGCTGGCGTTGCGGACGCGAGGC
TGGATGGCCTTCCCCATTATGATTCTTCTCGCTTCCGGCGGCATCGGGATGCCCGCGTTG
CAGGCCATGCTGTCCAGGCAGGTAGATGACGACCATCAGGGACAGCTTCAAGGATCGCTC
GCGGCTCTTACCAGCCTAACTTCGATCATTGGACCGCTGATCGTCACGGCGATTTATGCC
GCCTCGGCGAGCACATGGAACGGGTTGGCATGGATTGTAGGCGCCGCCCTATACCTTGTC
TGCTTCCCCGCGTTGCGTCGCGGTGCATGGAGCCGGGCCACCTCGACCTGAATGGAAGCC
GGCGGCACCTCGCTAACGGATTCACCACTCCAAGAATTGGAGCCAATCAATTCTTGGCGA
GAACTGTGAATGCGCAAACCAACCCTTGGCAGAACATATCCATCGCATGACCAAAATCCC

FIG.53B

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TTAACGTGAGTTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTC
TTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACACCGCTACC
AGCGGTGGTTTGTGGCCGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTT
CAGCAGAGCGCAGATACCAAATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTT
CAAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC
TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAA
GGCGCAGCGGTGCGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGAC
CTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGG
GAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGA
GCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTGCGGGTTTCGCCACCTCTGACT
TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAA
CGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCCTGC
GTTATCCCCTGATTCTGTGGATAACCGTATTACCGCTAGCCAGGAAGAGTTTGTAGAAAC
GCAAAAAGGCCATCCGTCAGGATGGCCTTCTGCTTAGTTTGATGCCTGGCAGTTTATGGC
GGGCGTCCTGCCCGCCACCTCCGGGCGGTTGCTTCAACGTTCAAAATCCGCTCCCGGC
GGATTTGTCTACTCAGGAGAGCGTTACCGGACAAACAACAGATAAAACGAAAGGCCCAG
TCTTCCGACTGAGCCTTTCGTTTTATTTGATGCCTGGCAGTTCCCTACTCTCGCGTTAAC
GCTAGCATGGATCTCGGGCCCCAAATAATGATTTTATTTGACTGATAGTGACCTGTTG
TTGCAACAAATTGATGAGCAATGCTTTTTTATAATGCCAACTTTGTACAAAAAGCTGAA
CGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCATAAAAAACAG
ACTACATAATACTGTAAACACAACATATCCAGTCACTATGAATCAACTACTTAGATGGT
ATTAGTGACCTGTAGTCGACCGACAGCCTTCCAAATGTTCTTCCGGGTGATGCTGCCAACT
TAGTCGACCGACAGCCTTCCAAATGTTCTTCTCAAACGGAATCGTCGTATCCAGCCTACT
CGCTATTGTCTCAATGCCGTATTAAATCATAAAAAGAAATAAGAAAAAGAGGTGCGAGC
CTTTTTTTGTGTGACAAAATAAAACATCTACCTATTATATACGCTAGTGTATAGTC
CTGAAAATCATCTGCATCAAGAACAATTTCAAACTCTTATACTTTTCTTTACAAGTCG
TTCGGCTTCATCTGGATTTTCAGCCTCTATACTTACTAAACGTGATAAAGTTTCTGTAAT
TTCTACTGTATCGACCTGCAGACTGGCTGTGTATAAGGGAGCCTGACATTTATATTCCCC
AGAACATCAGGTTAATGGCGTTTTTGATGTCATTTTCGCGGTGGCTGAGATCAGCCACTT
CTTCCCCGATAACGGAGACCGGCACACTGGCCATATCGGTGGTCATCATGCGCCAGCTTT
CATCCCCGATATGCACCACCGGTAAAGTTCACGGGAGACTTTATCTGACAGCAGACGTG
CACTGGCCAGGGGGATCACCATCCGTCGCGCGGGCGTGTCAATAATATCACTCTGTACAT
CCACAAACAGACGATAACGGCTCTCTTTTTATAGGTGTAAACCTTAACTGCATTTAC
CAGTCCCTGTTCTCGTCAGCAAAAGAGCCGTTCAATTAATAAACGGGCGACCTCAGCC
ATCCCTTCCTGATTTTCCGCTTTCAGCGTTCCGGCAGCAGACGACGGGCTTCATTCTGC
ATGGTTGTGCTTACCAGACCGGAGATATTGACATCATATATGCCTTGAGCAACTGATAGC
TGTCGCTGTCAACTGTCACTGTAATACGCTGCTTCATAGCACACCTCTTTTTGACATACT
TCGGGTATACATATCAGTATATATTCTTATACCGCAAAAATCAGCGCGCAAAATACGCATA
CTGTTATCTGGCTTTTAGTAAGCCGGATCCACGCGATTACGCCCCGCCCTGCCACTCATC
GCAGTACTGTTGTAATTCATTAAGCATTCTGCCGACATGGAAGCCATCACAGACGGCATG
ATGAACCTGAATCGCCAGC

FIG.53C

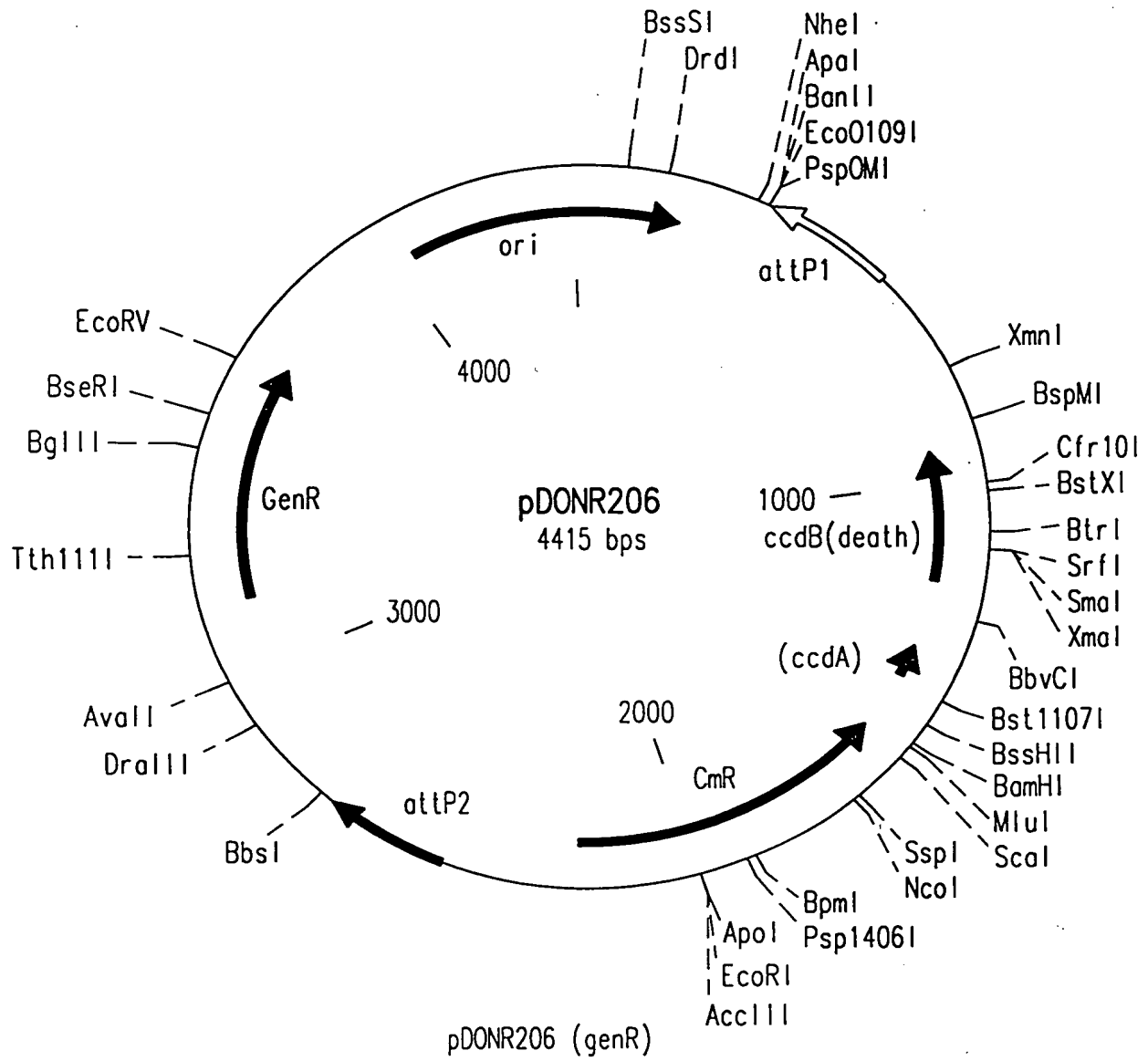


FIG.54A

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pDONR206 4415 bp

CGGCATTGAGGACAATAGCGAGTAGGCTGGATACGACGATTCCGTTTGAGAAGAACATTT
GGAAGGCTGTCTGGTTCGACTACAGGTCACCTAATACCATCTAAGTAGTTGAATCATAGTGAC
TGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTAATTTAAT
ATATTGATATTTATATCATTTTTACGTTTCTCGTTCAGCTTTTTTTGTACAAAGTTGGCATT
ATAAAAAAGCATTGCTTATCAATTTGTTGCAACGAACAGGTCACCTATCAGTCAAAATAAA
ATCATTATTTGGGGCCCGAGATCCATGCTAGCGGTAATACGGTTATCCACAGAATCAGGG
GATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAG
GCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGA
CGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCT
GGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCC
TTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTTCG
GTGTAGGTCGTTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTACGCCCCGACCGC
TGCGCCTTATCCGGTAACATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCA
CTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAG
TTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCT
CTGCTGAAGCCAGTTACCTTCGGA AAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACC
ACCGCTGGTAGCGGTGGTTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGA
TCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACCTCA
CGTTAAGGGATTTTGGTCATGNCGCCGTCCCGTCAAGTCAGCGTAATGCTCTGCCAGTGT
TACAACCAATTAACCAATTCTGATTAGAAAACTCATCGAGCATCAAATGAAACTGCAAT
TTATTCATATCAGGATTATCAATACCATATTTTTGAAAAAGCCGTTTCTGTAATGAAGGA
GAAAACCTACCGAGGCAGTTCCATAGGATGGCAAGATCCTGGTATCGGTCTGCGATTCCG
ACTCGTCCAACATCAATACAACCTATTAGCCGAGGTCTTCCGATCTCCTGAAGCCAGGGC
AGATCCGTGCACAGCACCTTGCCGTAGAAGAACAGCAAGGCCGCAATGCCTGACGATGC
GTGGAGACCGAAACCTTGCGCTCGTTGCCAGCCAGGACAGAAATGCCTCGACTTCGCTG
CTGCCAAAGGTTGCCGGGTGACGCACACCGTGGAACCGGATGAAGGCACGAACCCAGTTG
ACATAAGCCTGTTTCGGTTCGTAACTGTAATGCAAGTAGCGTATGCGCTCACGCAACTGG
TCCAGAACCTTGACCGAACGCAGCGGTGGTAACGGCGCAGTGGCGGTTTTTCATGGCTTGT
TATGACTGTTTTTTTTGTACAGTCTATGCCTCGGGCATCCAAGCAGCAAGCGCGTTACGCC
GTGGGTCGATGTTTGATGTTATGGAGCAGCAACGATGTTACGCAGCAGCAACGATGTTAC
GCAGCAGGGCAGTCGCCCTAAACAAAGTTAGGTGGCTCAAGTATGGGCATCATTCGCAC
ATGTAGGCTCGGCCCTGACCAAGTCAAATCCATGCGGGCTGCTCTTGATCTTTTCGGTCG
TGAGTTCGGAGACGTAGCCACCTACTCCCAACATCAGCCGGACTCCGATTACCTCGGGAA
CTTGCTCCGTAGTAAGACATTCATCGCGCTTGCTGCCTTCGACCAAGAAGCGGTTGTTGG
CGCTCTCGCGGCTTACGTTCTGCCAGGTTTGAGCAGCCGCGTAGTGAGATCTATATCTA
TGATCTCGCAGTCTCCGGCGAGCACCGGAGGCAGGGCATTGCCACCGCGCTCATCAATCT
CCTCAAGCATGAGGCCAACGCGCTTGGTGCTTATGTGATCTACGTGCAAGCAGATTACGG
TGACGATCCCGCAGTGGCTCTCTATACAAAGTTGGGCATACGGGAAGAAGTGATGCACTT
TGATATCGACCCAAGTACCGCCACCTAACAATTTCGTTCAAGCCGAGATCGGCTTCCCGGC
CTAATTTCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCACCATGAGTGACGACTG
AATCCGGTGAGAATGGCAAAAGCGTATGCATTTCTTTCCAGACTTGTTCAACAGGCCAGC
CATTACGCTCGTCATCAAAATCACTCGCATCAACCAAACCGTTATTCATTCTGTGATTGCG

FIG.54B

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CCTGAGCGAGACGAAATACGCGATCGCTGTAAAAGGACAATTACAAACAGGAATCGAAT
GCAACCGGCGCAGGAACACTGCCAGCGCATCAACAATATTTTCACCTGAATCAGGATATT
CTTCTAATACCTGGAATGCTGTTTTCCCGCGGATCGCAGTGGTGAGTAACCATGCATCAT
CAGGAGTACGGATAAAATGCTTGATGGTCGGAAGAGGCATAAATCCGTCAGCCAGTTTA
GTCTGACCATCTCATCTGTAACATCATTGGCAACGCTACCTTTGCCATGTTTCAGAAACA
ACTCTGGCGCATCGGGCTTCCCATACAATCGAAAGATTGTCGCACCTGATTGCCCGACAT
TATCGCGAGCCCATTTATACCCATATAAATCAGCATCCATGTTGGAATTTAATCGCGGCC
TCCAGCAAGACGTTTTCCCGTTGAATATGGCTCATAACACCCCTTGTATTACTGTTTATGT
AAGCAGACAGTTTTATTGTTTCATGATGATATATTTTTATCTTGTGCAATGTAACATCAGA
GATTTTGAGACACGGGCCNCGCGCACTGCAGCTGGATCGGCAAATAATGATTTTATTTTG
ACTGATAGTGACCTGTTGTTGCAACAAATTGATAAGCAATGCTTTTTTATAATGCCAAC
TTTGTACAAGAAAGCTGAACGAGAAACGTAAATGATATAAATATCAATATATTAAATTA
GATTTTGCATAAAAAACAGACTACATAATACTGTAAACACAACATATCCAGTCACTATG
ATTCAACTACTTAGATGGTATTAGTGACCTGTAGTCGACTAAGTTGGCAGCATCACCCGA
CGCACTTTGCGCCGAATAAATACCTGTGACGGAAGATCACTTCGCAGAATAAATAAATCC
TGGTGTCCCTGTTGATACCGGGAAGCCCTGGGCCAACTTTTGGCGAAAATGAGACGTTGA
TCGGCACGTAAGAGGTTCCAACTTTCACCATAATGAAATAAGATCACTACCGGGCGTATT
TTTTGAGTTATCGAGATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGG
ATATACCACCGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGAGGCATTTTCAGTC
AGTTGCTCAATGTACCTATAACCAGACCGTTTCAGCTGGATATTACGGCCTTTTTAAAGAC
CGTAAAGAAAAATAAGCACAAAGTTTTATCCGGCCTTTATTACATTCTTGCCCGCCTGAT
GAATGCTCATCCGGAATTCGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAG
TGTTACCCCTTGTTACACCGTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGCTCTGGAG
TGAATACCACGACGATTTCCGGCAGTTTCTACACATATATTCGCAAGATGTGGCGTGTTA
CGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTTATTGAGAATATGTTTTTCGTCTCAGC
CAATCCCTGGGTGAGTTTACCAGTTTTGATTTAAACGTGGCCAATATGGACAACCTTCTT
CGCCCCGTTTTTACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCT
GGCGATTTCAGTTTCATCATGCCGTCTGTGATGGCTTCCATGTCGGCAGAATGCTTAATGA
ATTACAACAGTACTGCGATGAGTGGCAGGGCGGGGCGTAAACGCGTGGATCCGGCTTACT
AAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAATATATAC
TGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTG
ACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTC
TGGTAAGCACAAACCATGCAGAATGAAGCCCGTCGTCTGCGTGCCGAACGCTGGAAAGCGG
AAAATCAGGAAGGGATGGCTGAGGTGCGCCGTTTTATTGAAATGAACGGCTCTTTTGCTG
ACGAGAACAGGGACTGGTGAAATGCAGTTTAAGGTTTACACCTATAAAAGAGAGAGCCGT
TATCGTCTGTTTTGTGGATGTACAGAGTGATATTATTGACACGCCCGGGCGACGGATGGTG
ATCCCCCTGGCCAGTGACAGTCTGCTGTCAGATAAAGTCTCCCGTGAACTTTACCCGGTG
GTGCATATCGGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGGTC
TCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCC
ATTAACCTGATGTTCTGGGGAATATAAATGTCAGGCTCCGTTATACACAGCCAGTCTGCA
GGTCGATACAGTAGAAATTACAGAACTTTATCACGTTTAGTAAGTATAGAGGCTGAAAA
TCCAGATGAAGCCGAACGACTTGTAAGAGAAAAGTATAAGAGTTGTGAAATTGTTCTTGA
TGCAGATGATTTTCAGGACTATGACACTAGCATATATGAATAGGTAGATGTTTTTATTTT
GTCACACAAAAAAGAGGCTCGCACCTTTTTTCTTATTTCTTTTTATGATTTAATA

FIG.54C

An Entry (pENTR7) Clone of CAT Subcloned into pDEST2

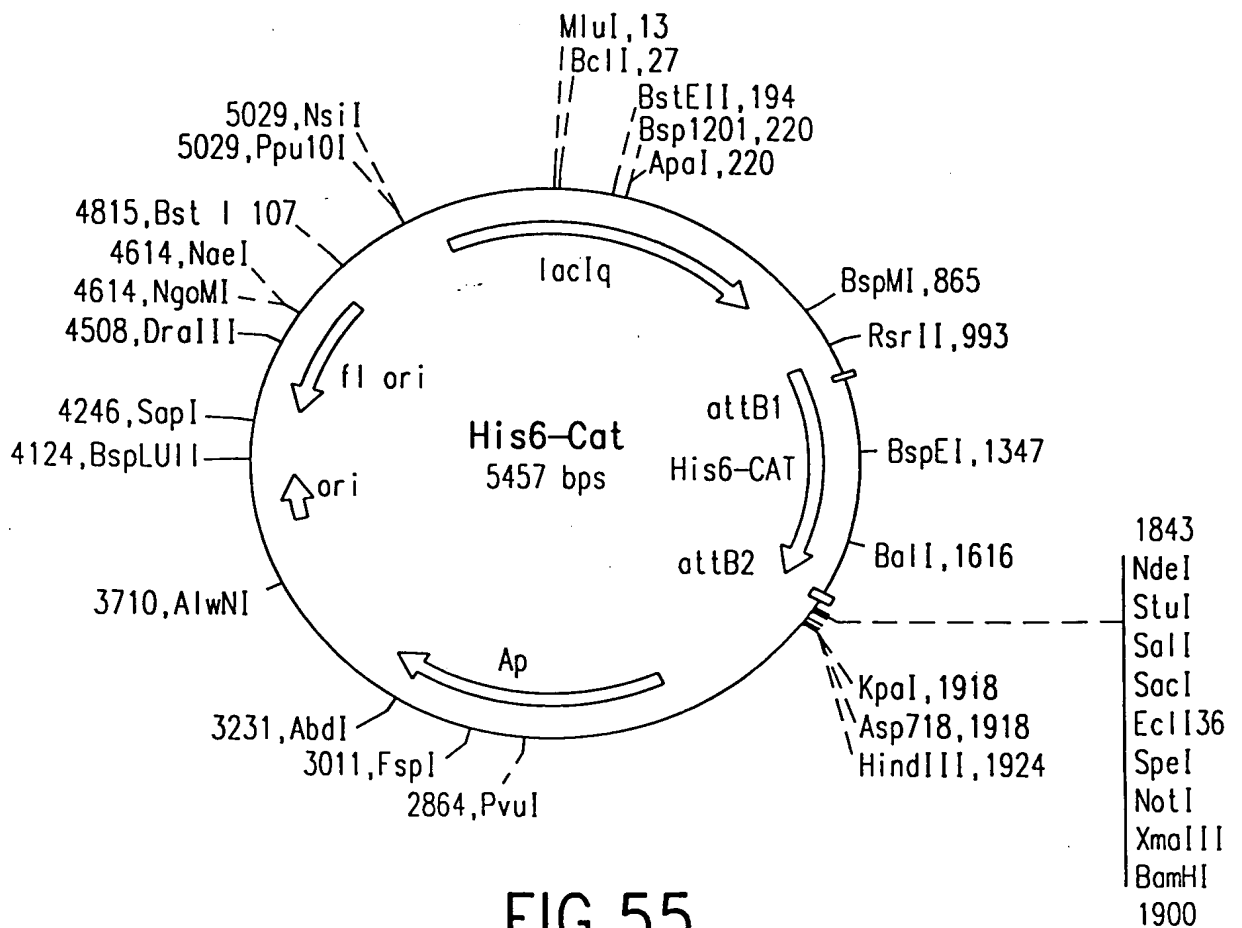
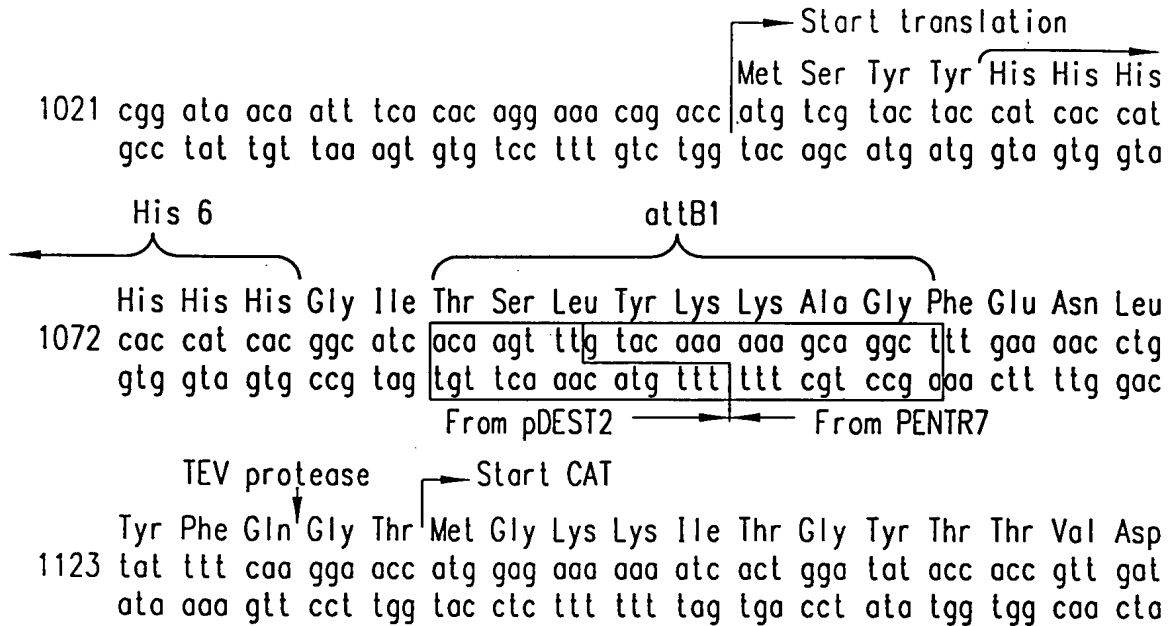


FIG.55

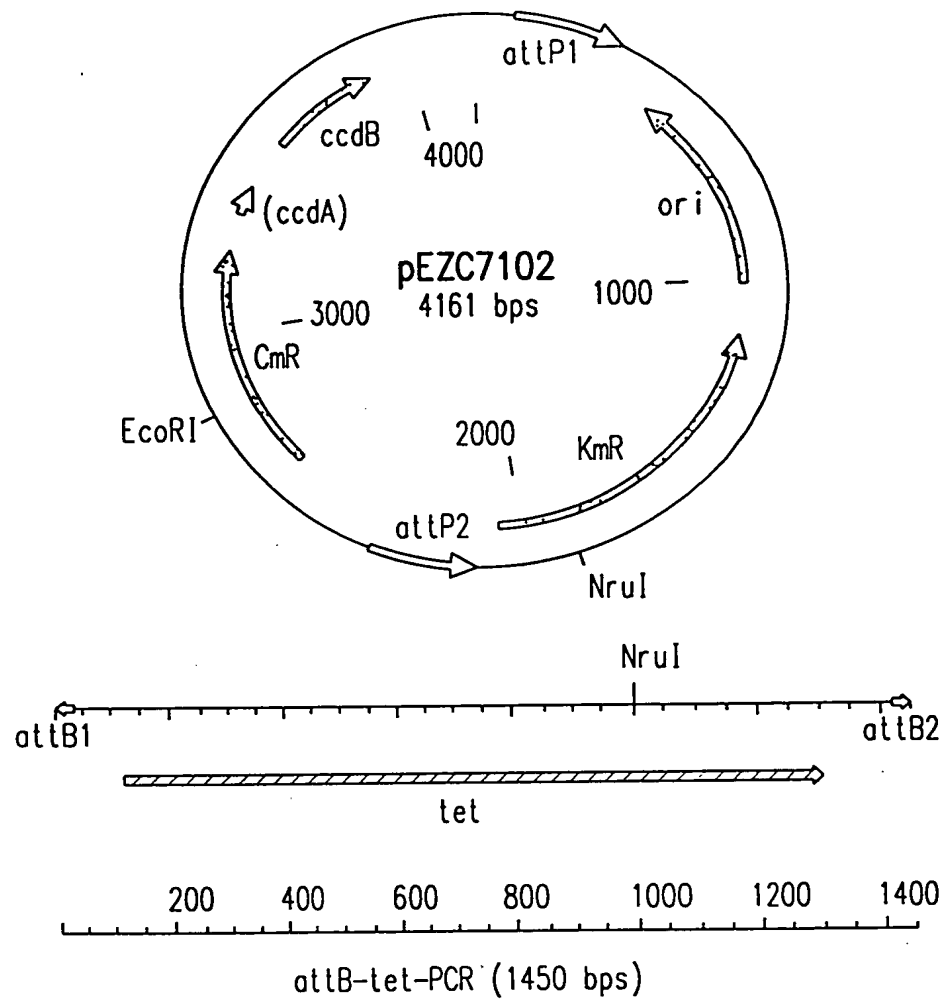


FIG.56

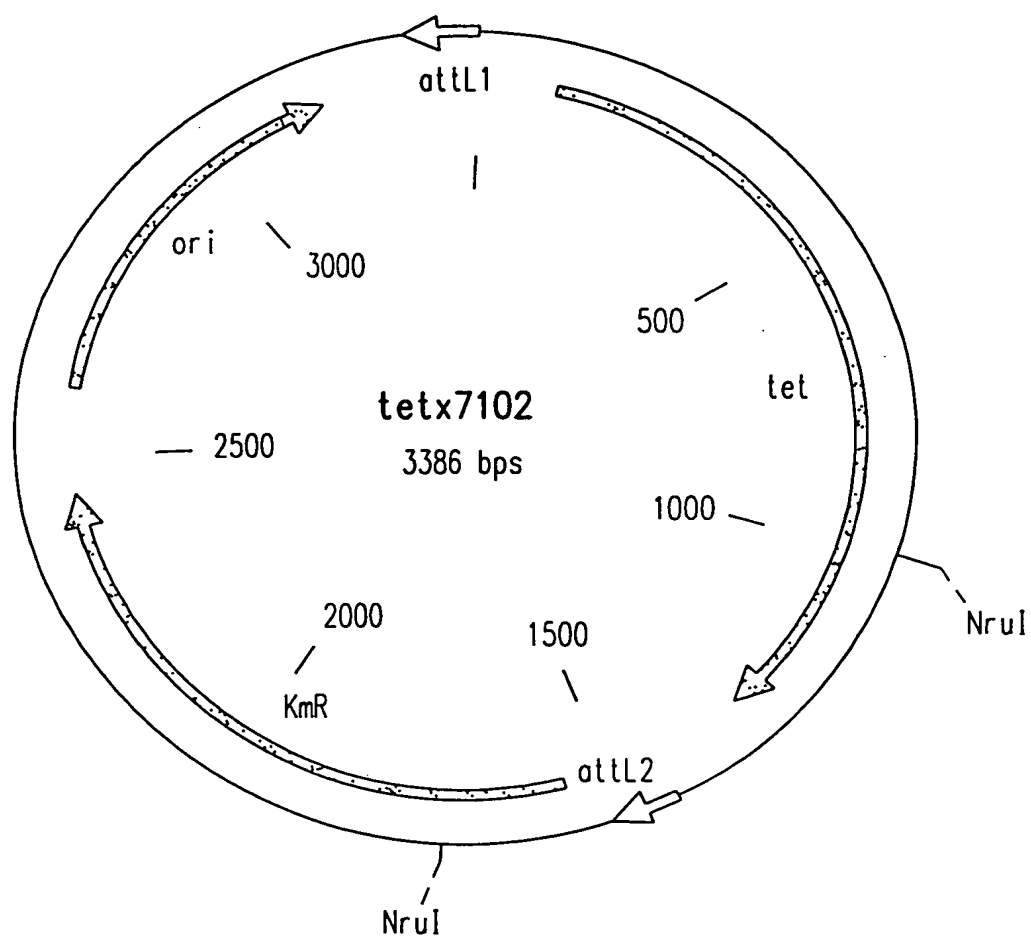


FIG.57

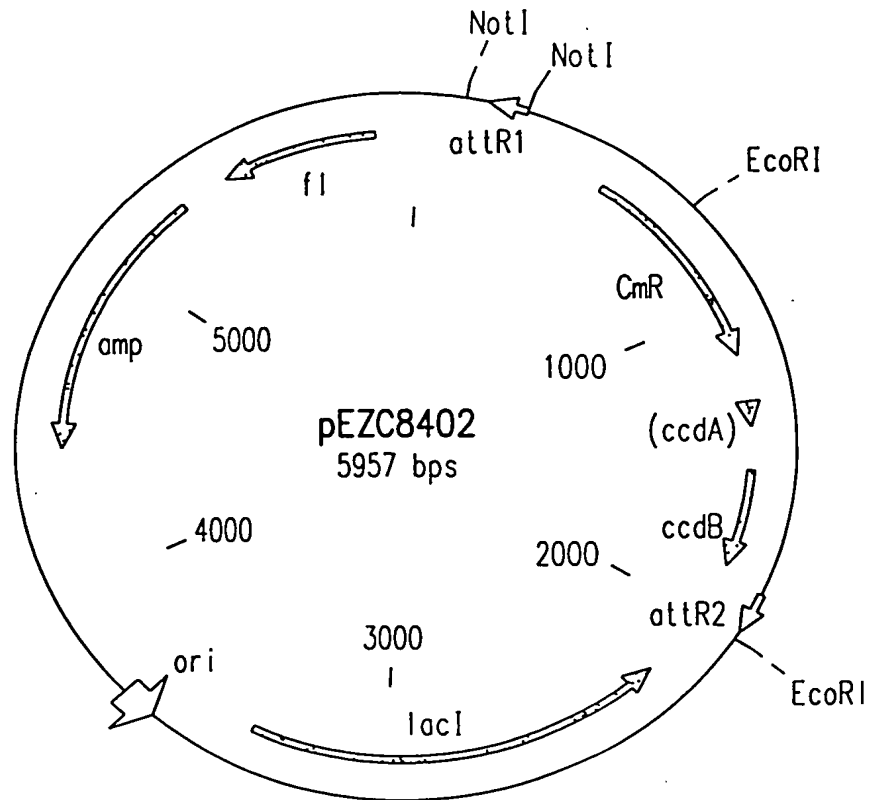


FIG.58

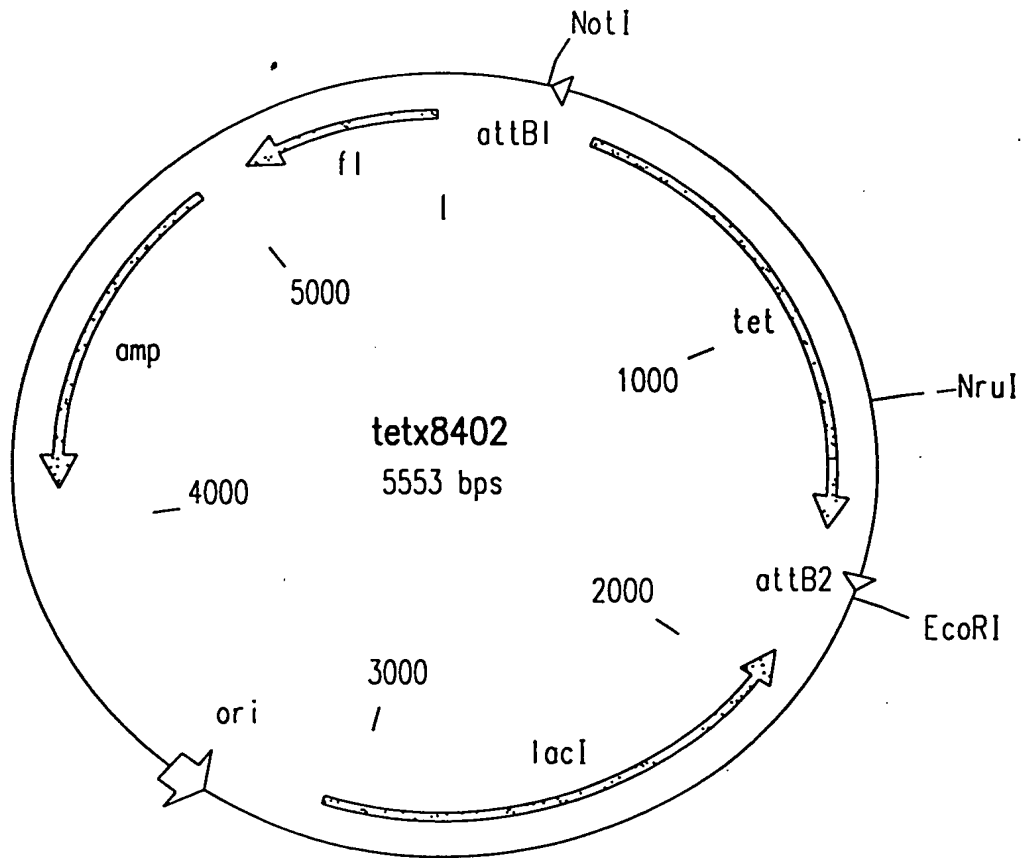


FIG.59

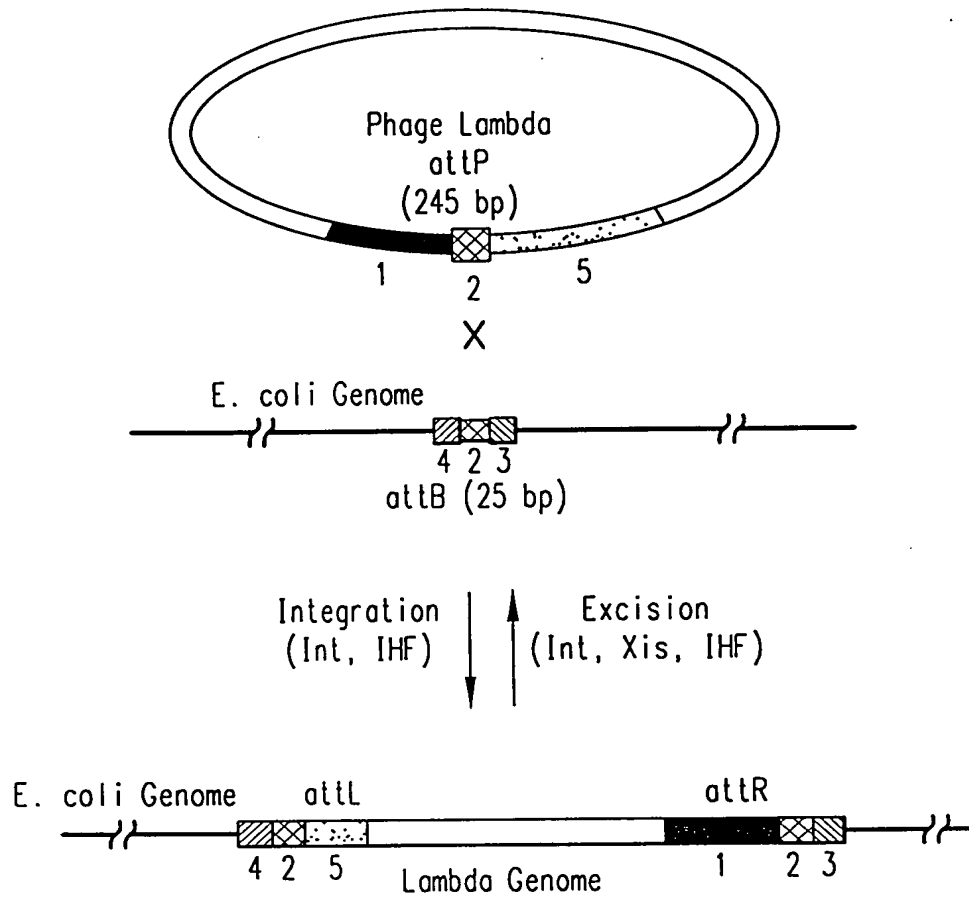


FIG.60

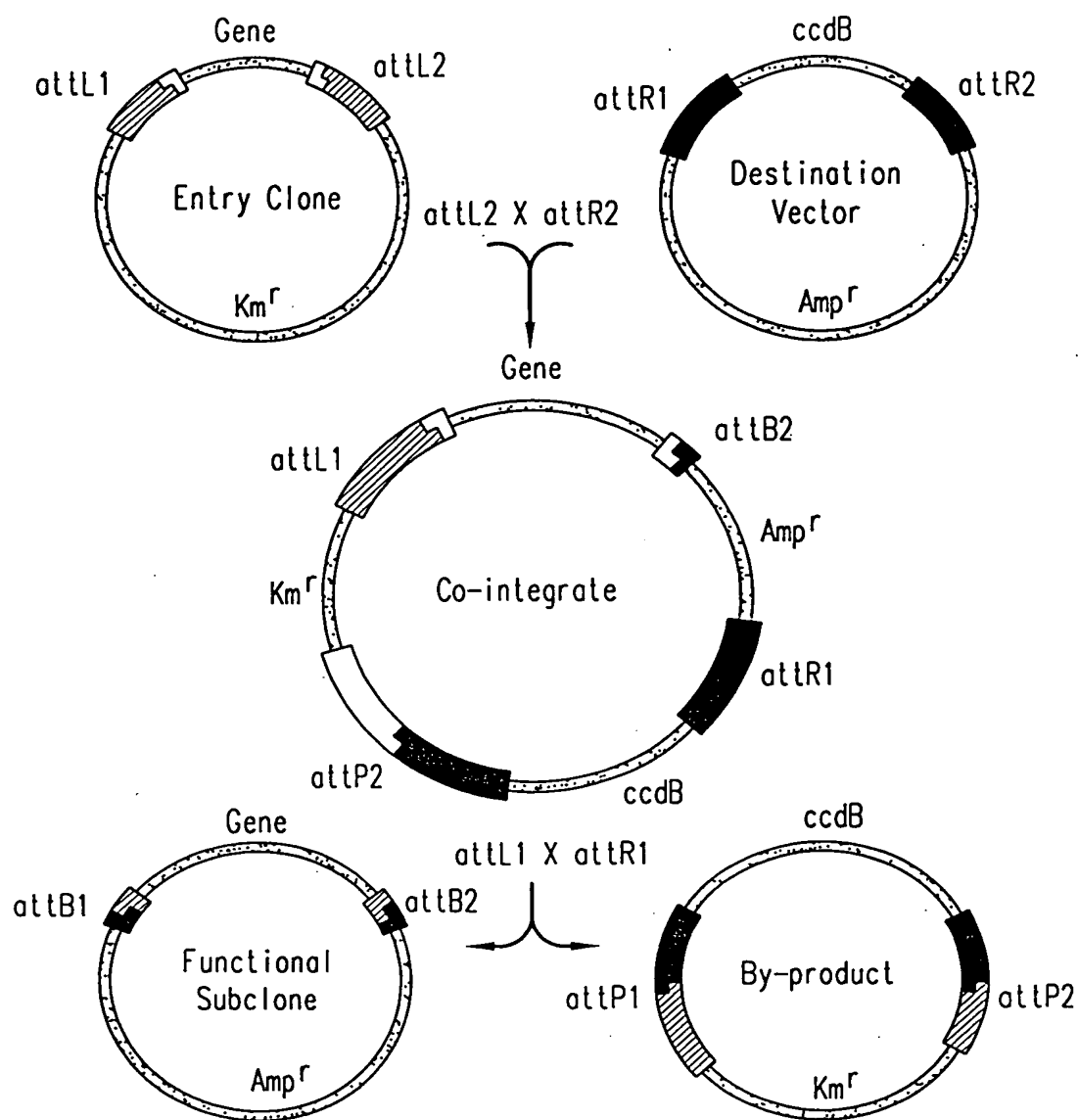
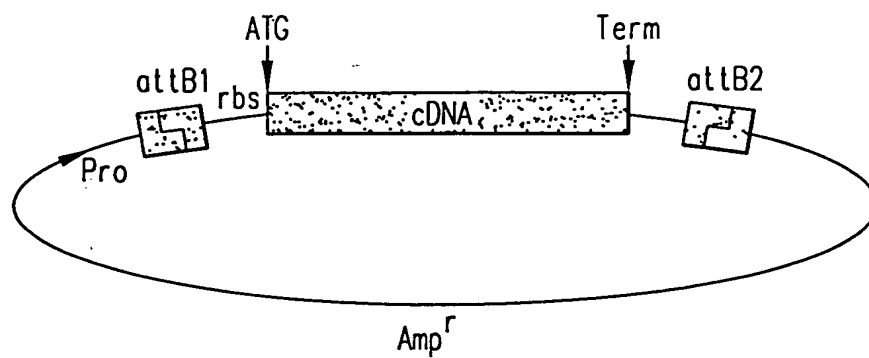


FIG.61

Native Protein Expression:



Fusion Protein Expression:

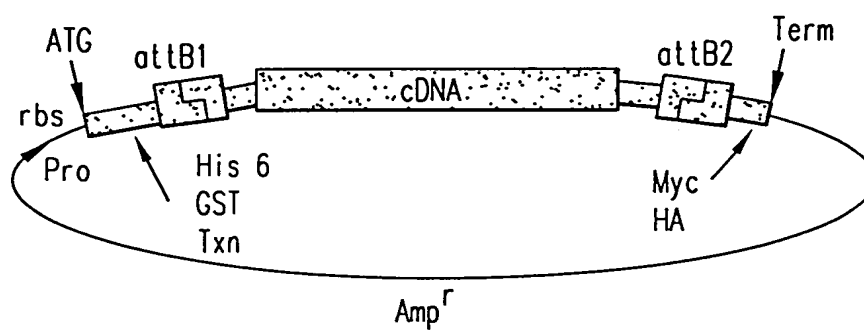


FIG.62

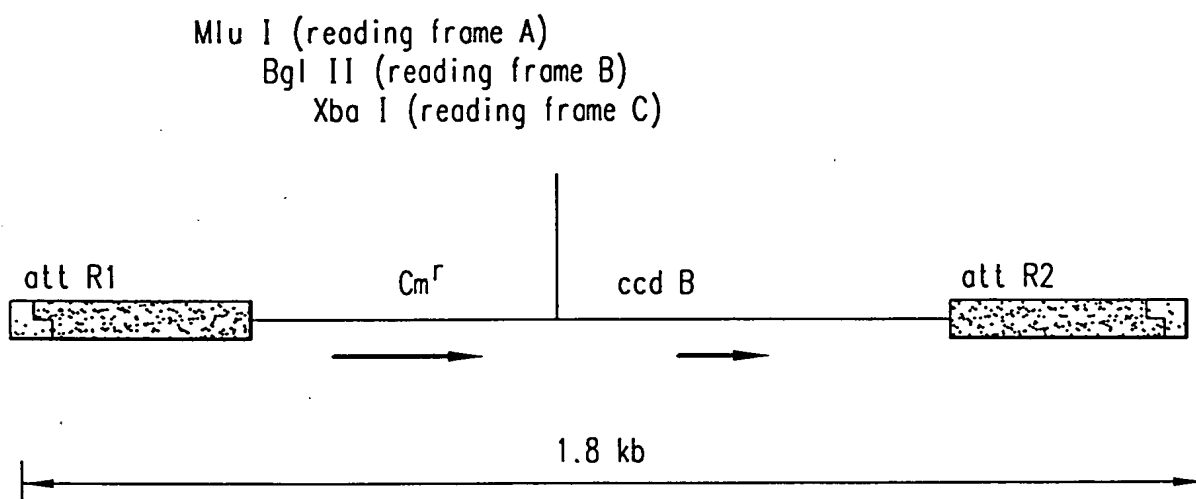


FIG.63

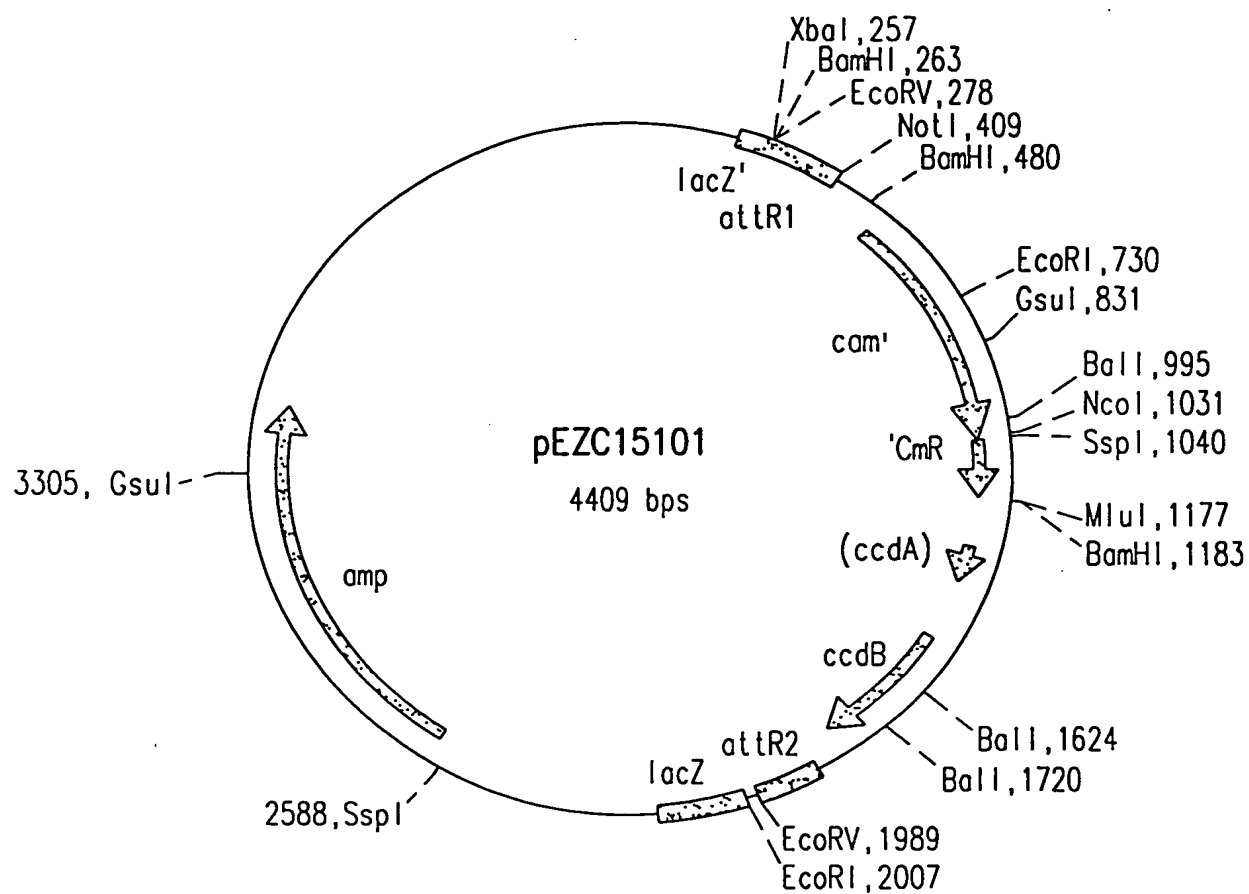


FIG.64A

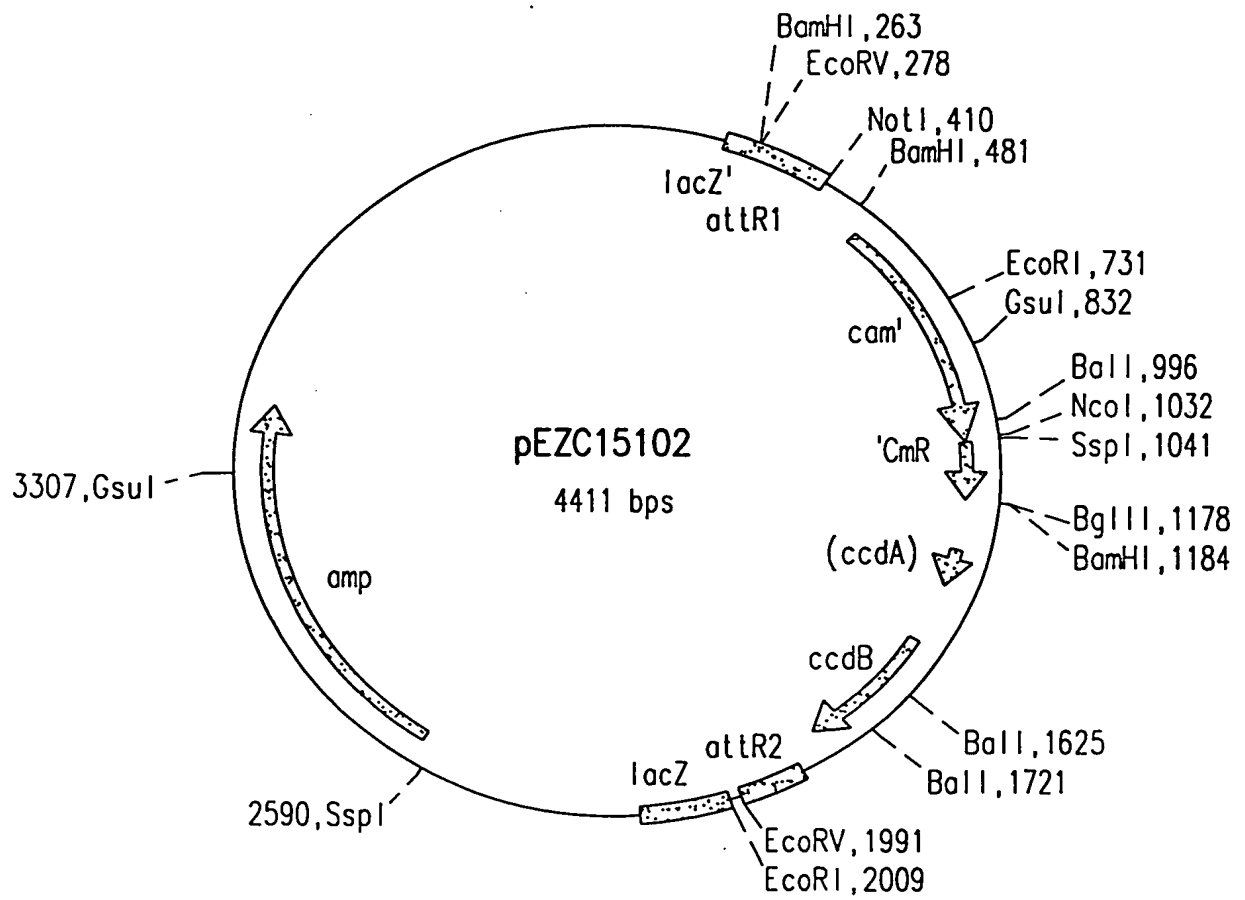


FIG.64B

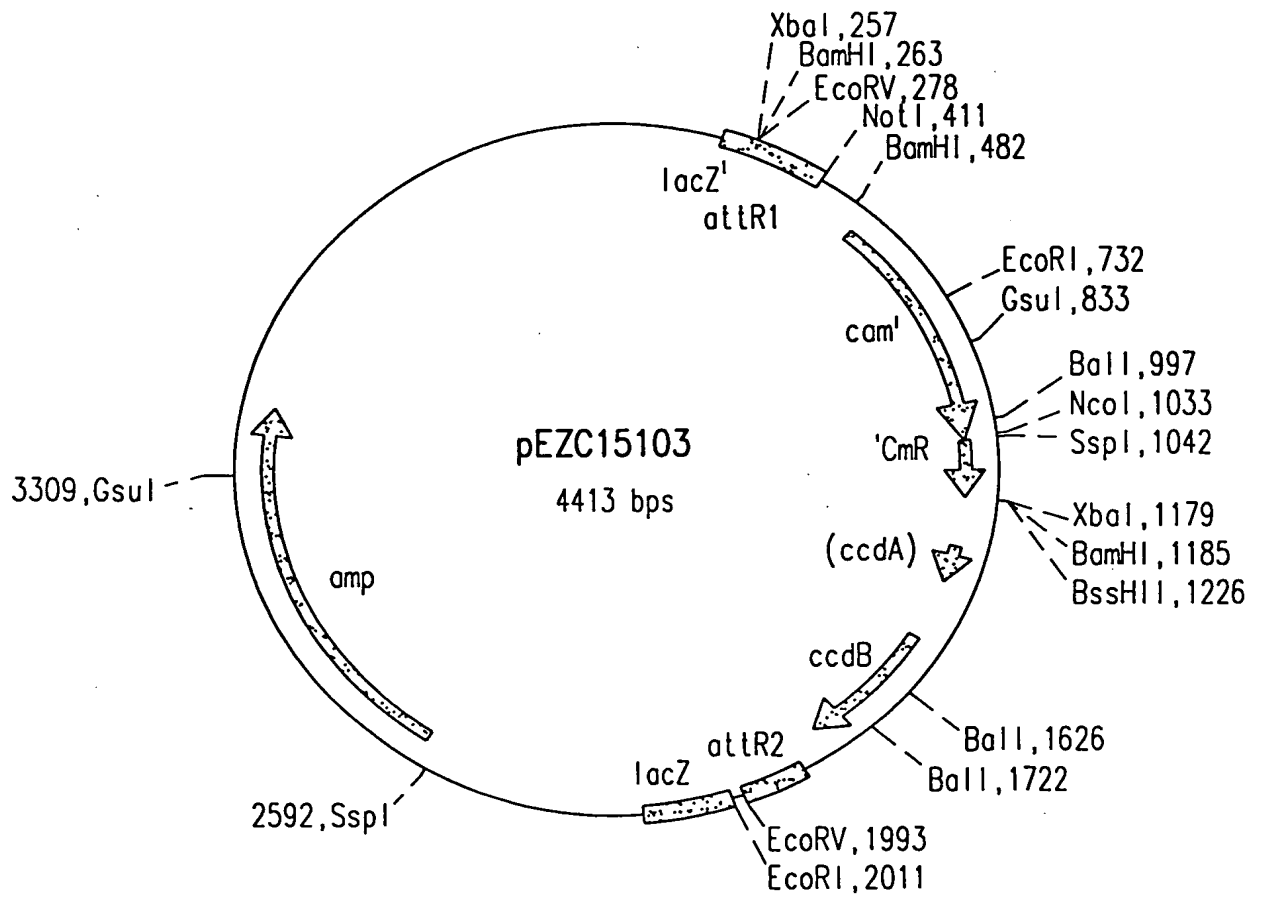


FIG.64C

PRIMERS FOR AMPLIFYING Tet^R AND Amp^R
FOR CLONING BY RECOMBINATION

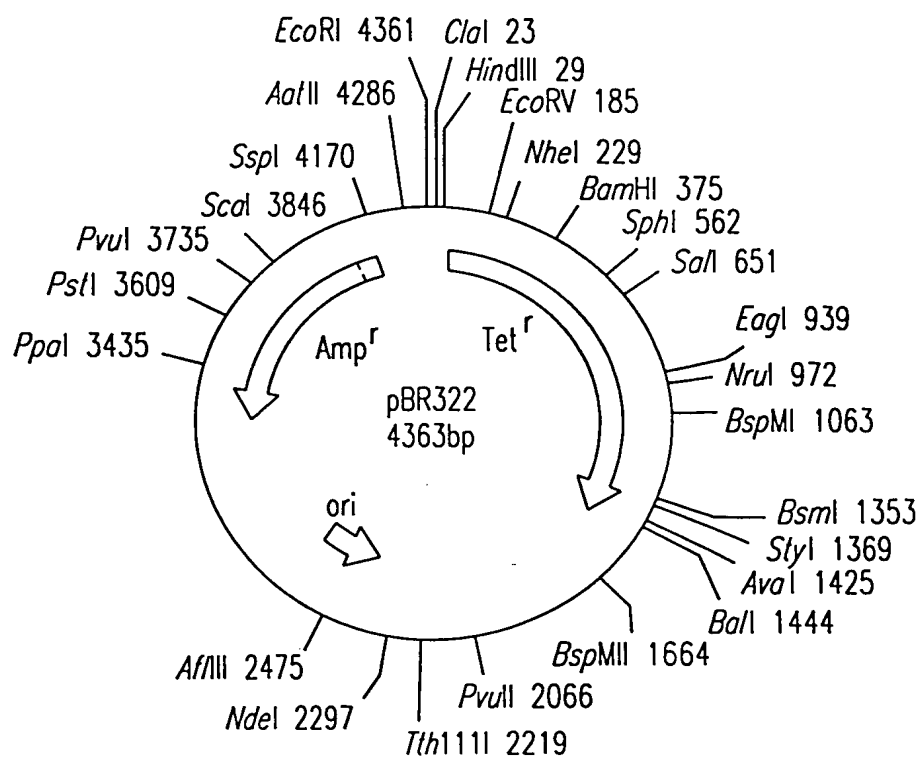
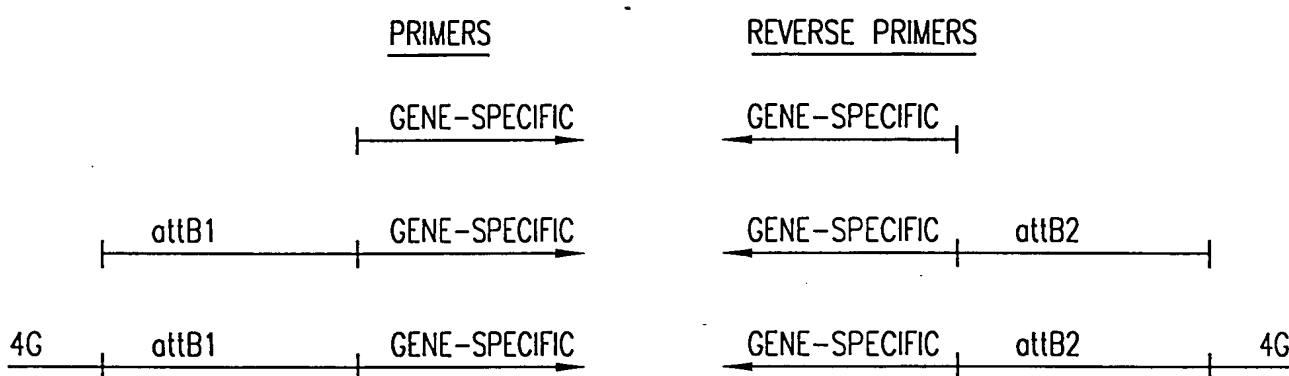


FIG. 65

RESULTS OF CLONING
tet AND amp PCR PRODUCTS
BY RECOMBINATION

PCR PRODUCT USED IN GCS REACTIONS	NO. COLONIES OBTAINED (100 μ l PLATED)	FORM OF DNA ANALYZED	COLONIES OBTAINED OF PREDICTED SIZE
tet	6, 10	SC	0 OF 8
attB-tet	9, 6	SC	1 OF 8
attB+4G-tet	824, 1064	SC AvaI+Bam	7 OF 7 7 OF 7
amp	7, 13	SC	0 OF 8
attB-amp	18, 22	SC	3 OF 8
attB+4G-amp	3020, 3540	SC PstI	8 OF 8 8 OF 8
attB Plasmid (Pos. Control)	320, 394		

FIG. 66

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EFFECT OF G's ON 5' END OF PCR attB SITES

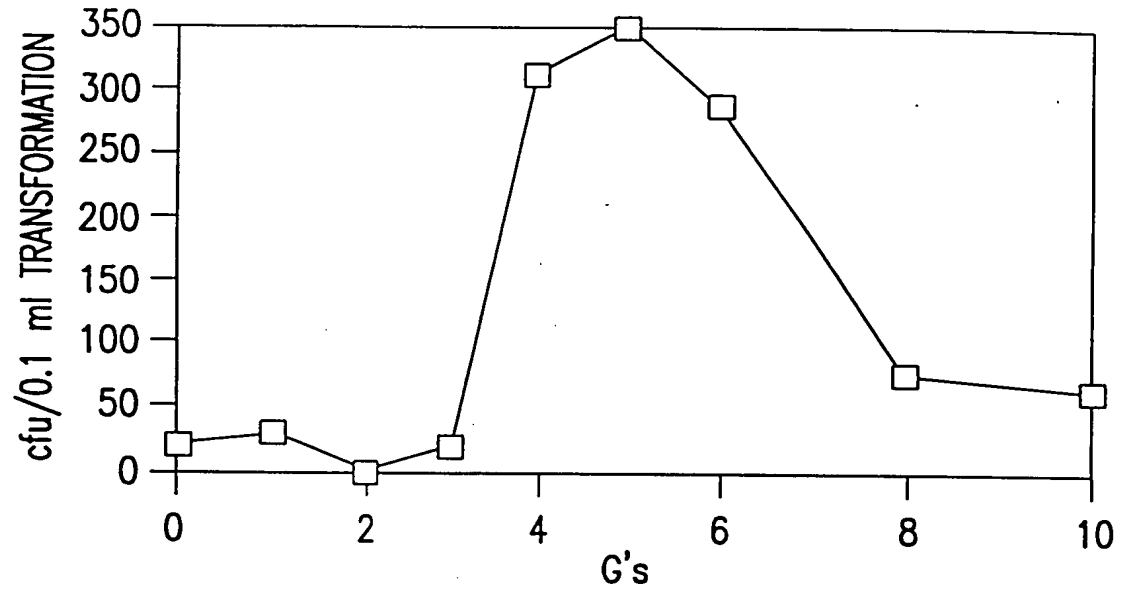


FIG.67

TITRATION OF attP AMOUNTS WITH VARIOUS attB PCR AMOUNTS IN BxP REACTION

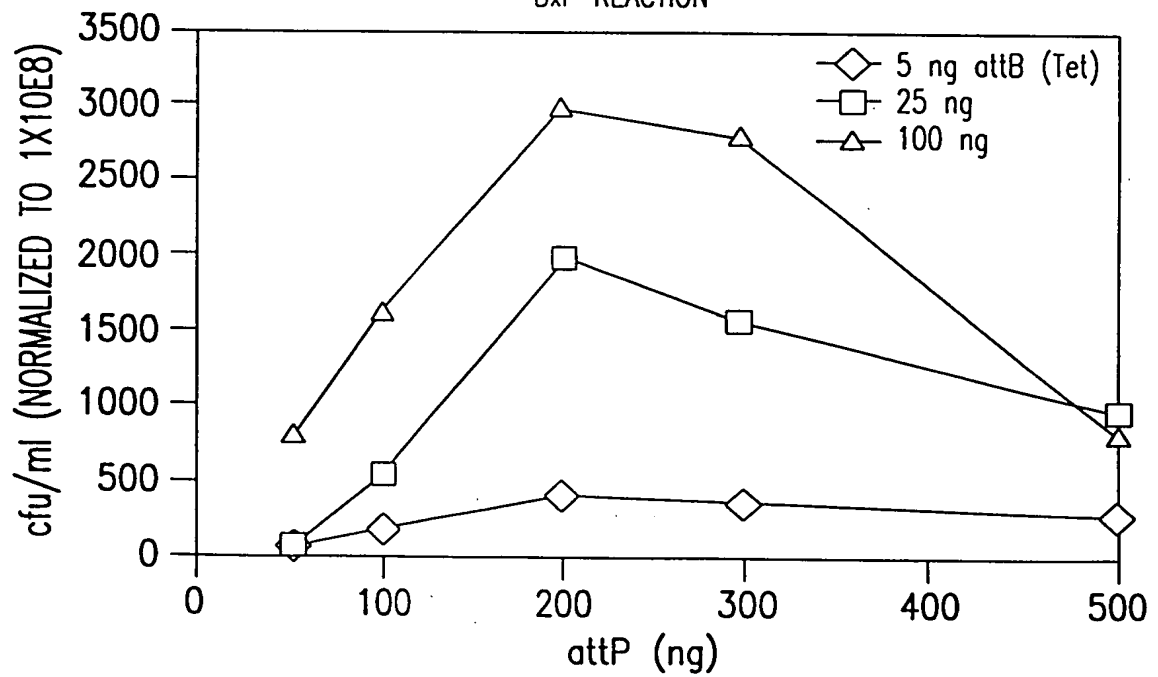


FIG.68

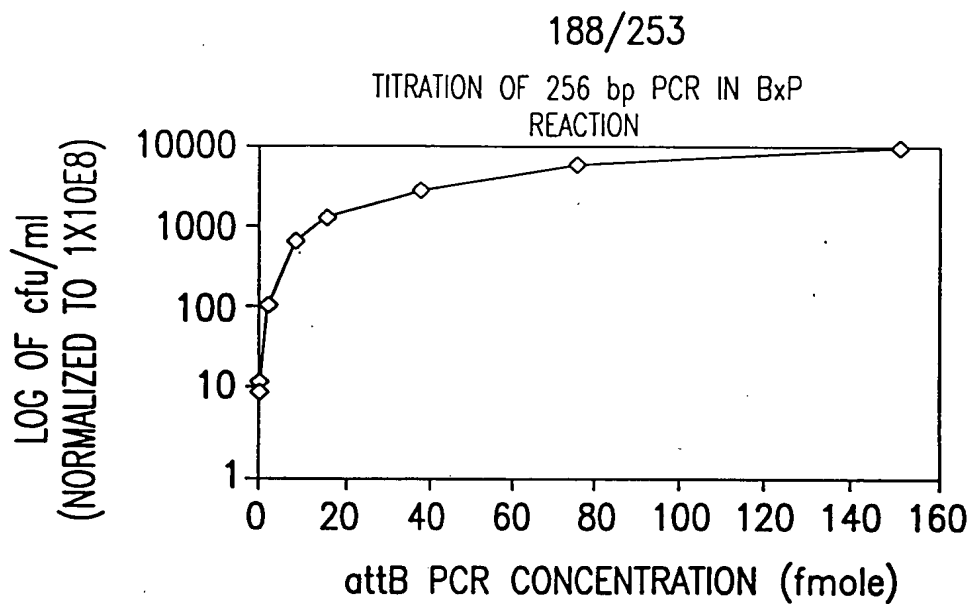


FIG.69A

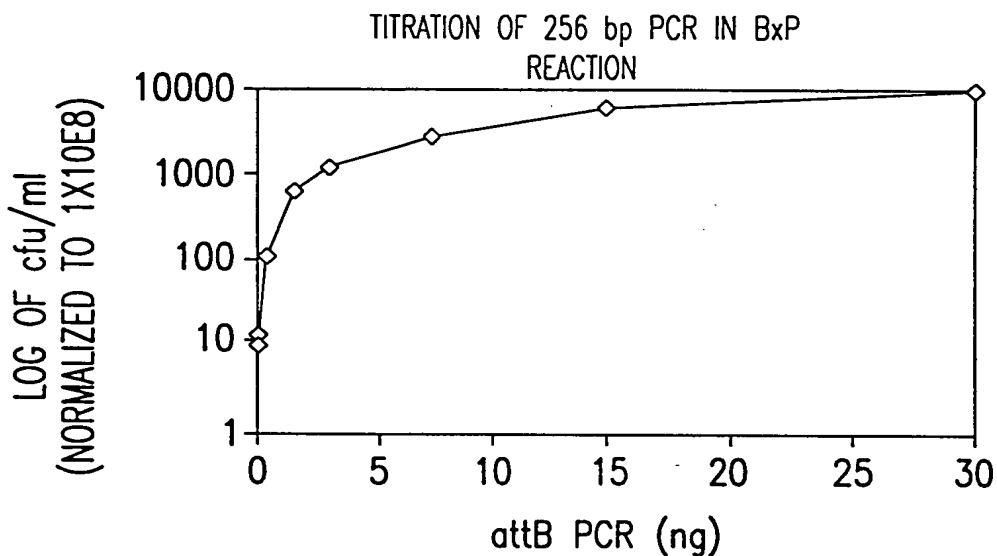


FIG.69B

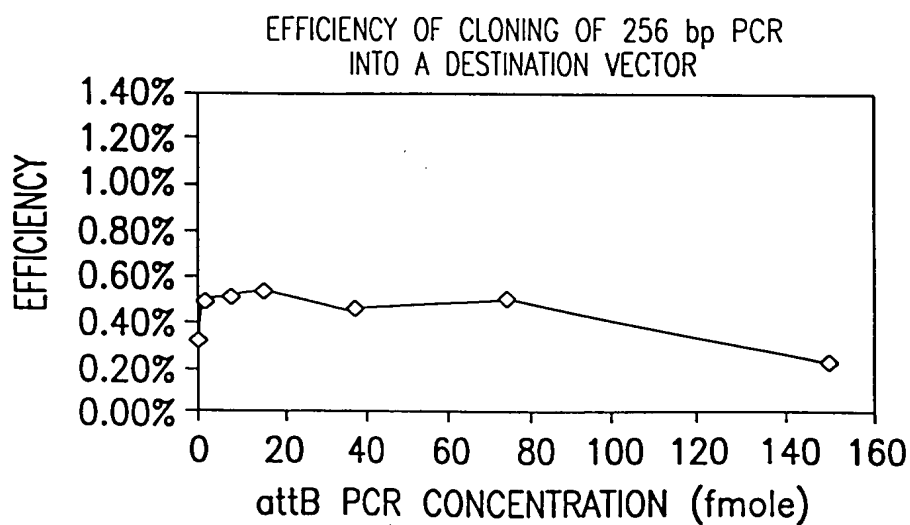


FIG.69C

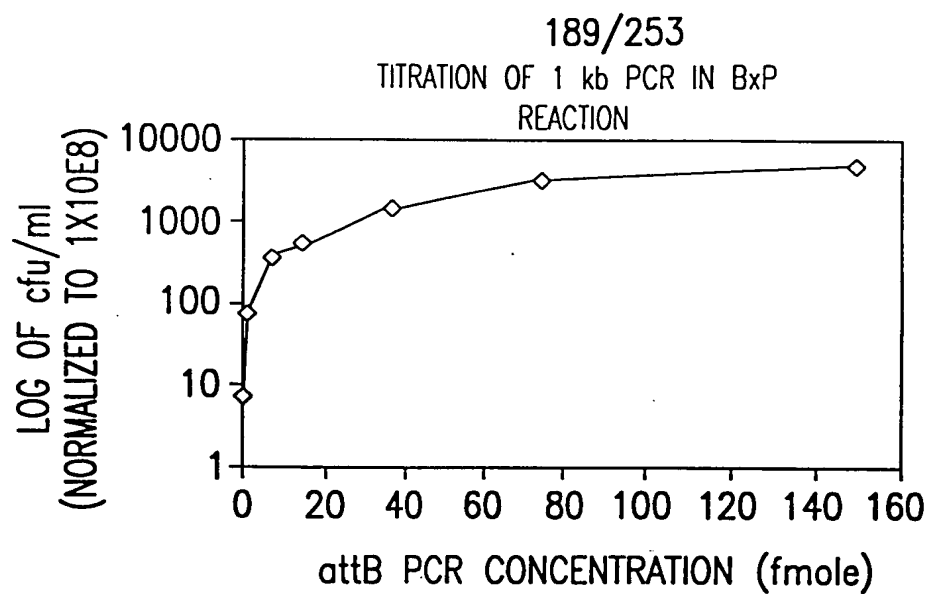


FIG.70A

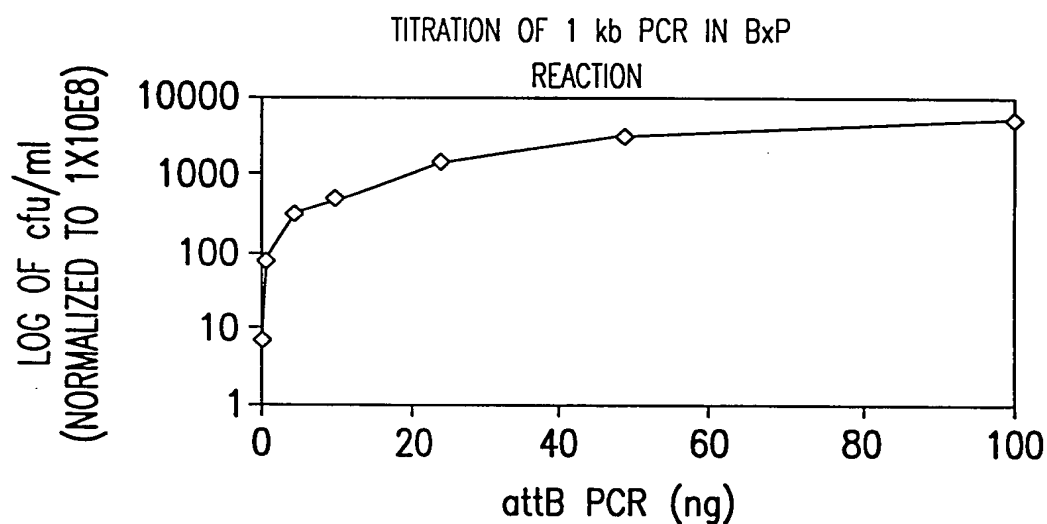


FIG.70B

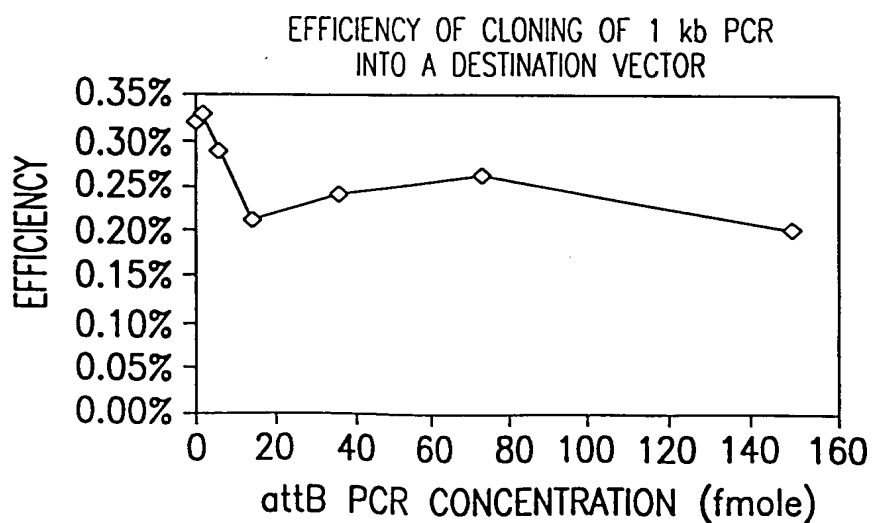


FIG.70C

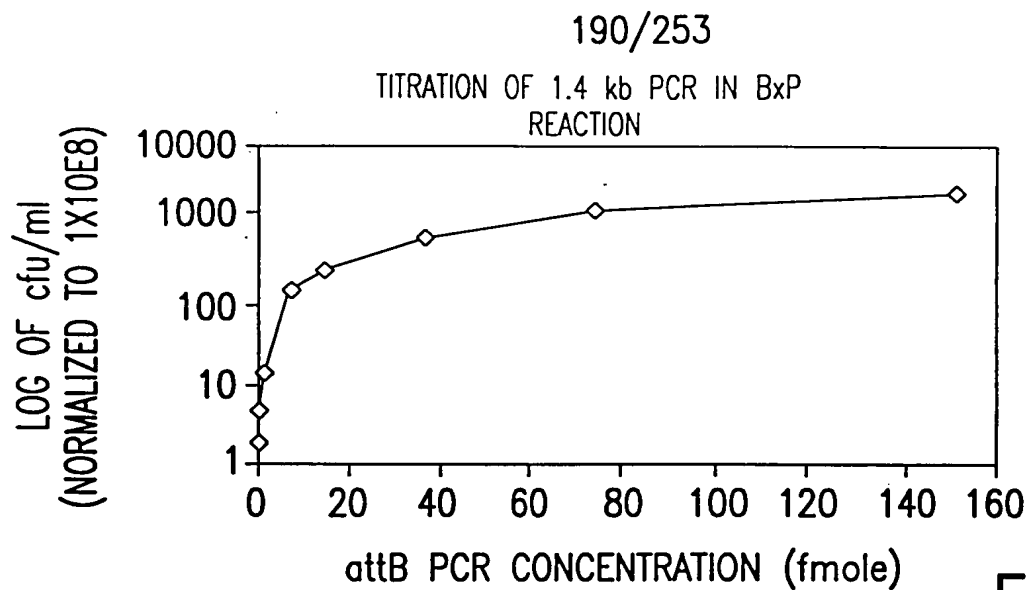


FIG.71A

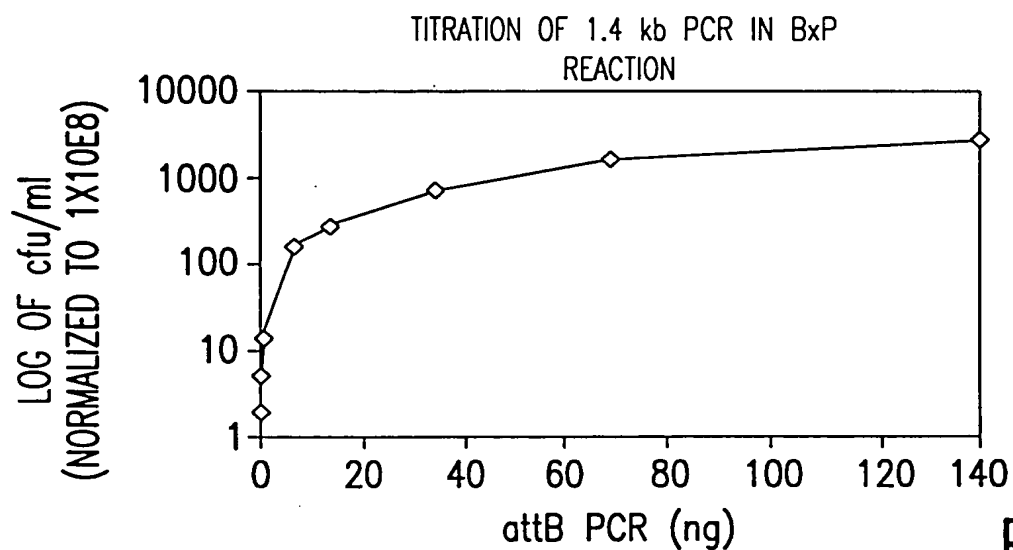


FIG.71B

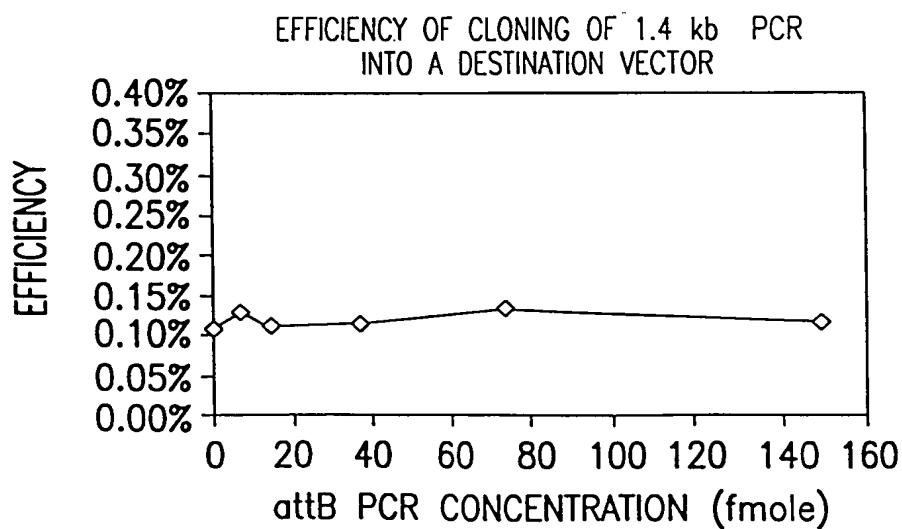


FIG.71C

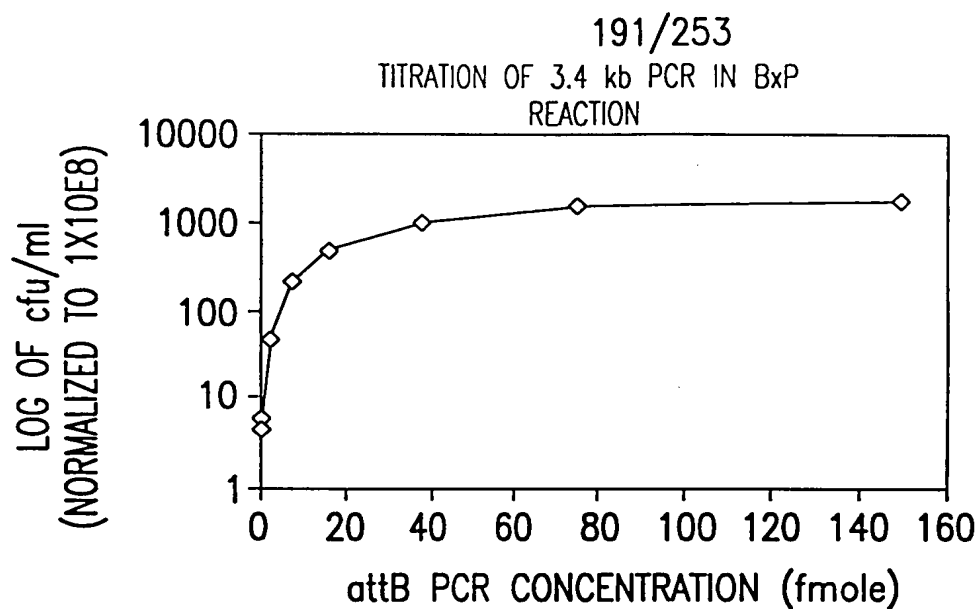


FIG.72A

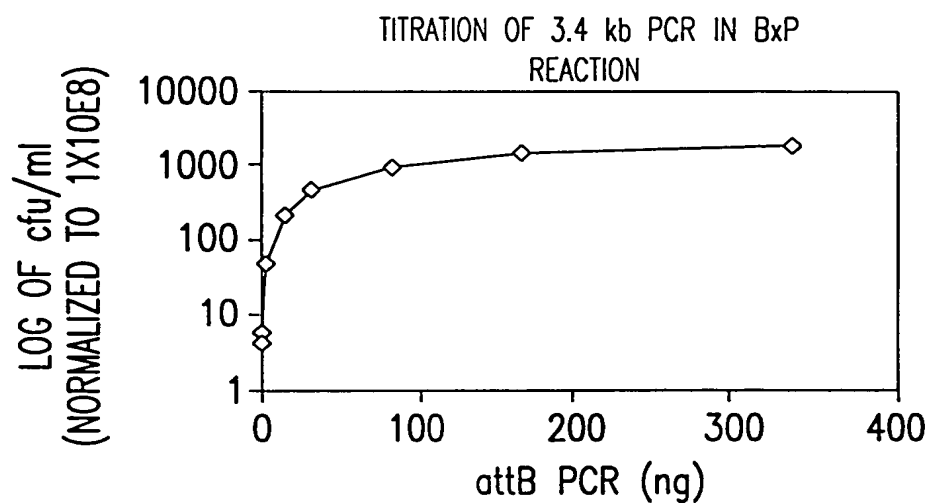


FIG.72B

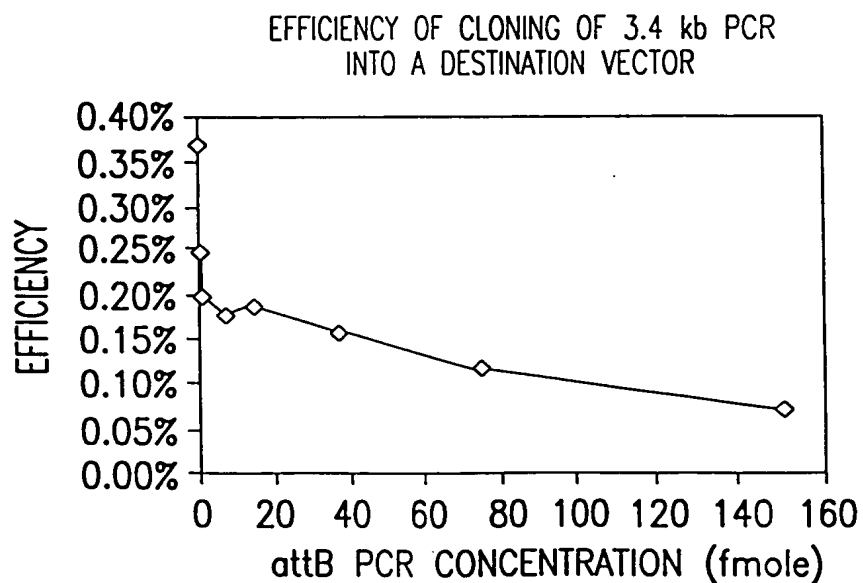


FIG.72C

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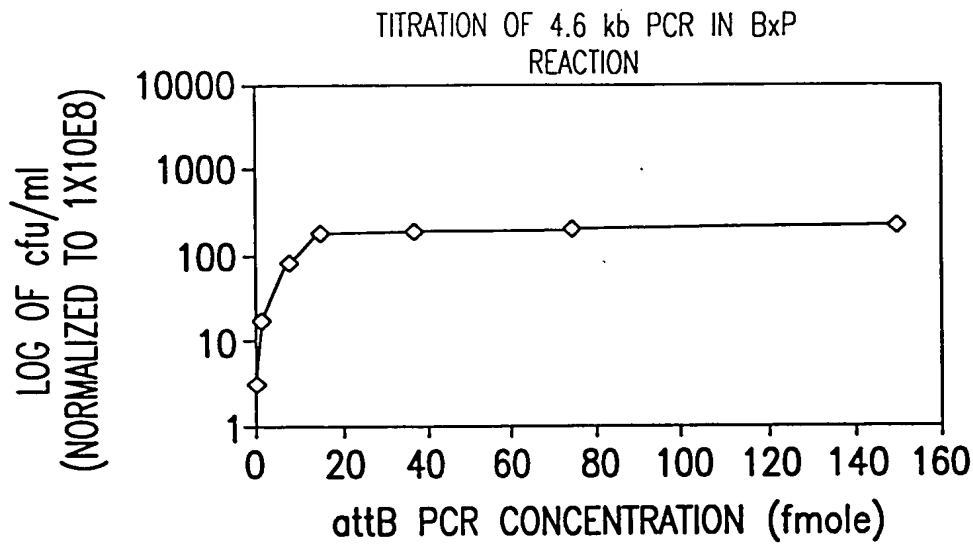


FIG.73A

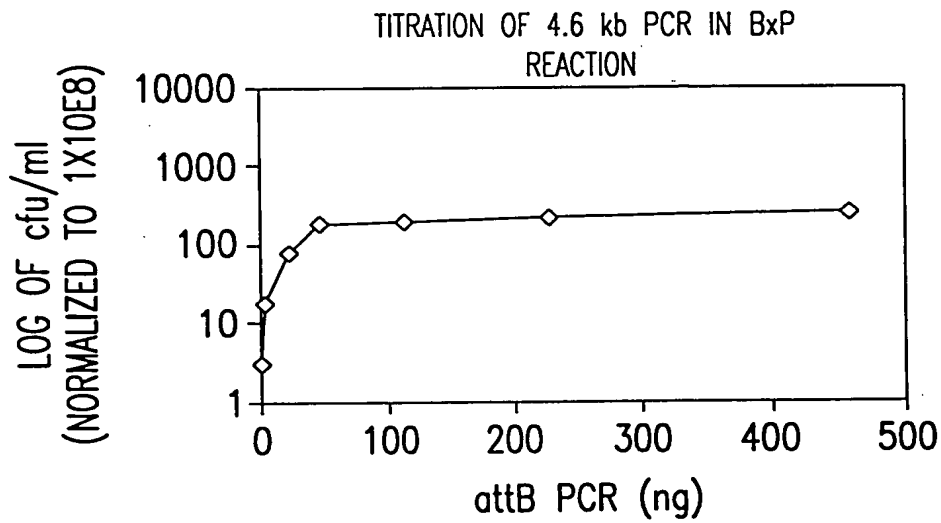


FIG.73B

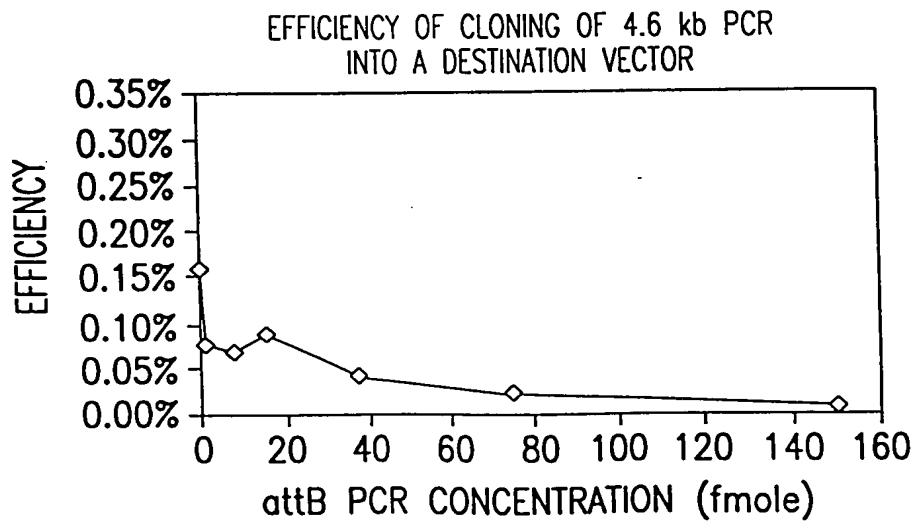


FIG.73C

6.9 kb PCR DNA Titration in a BxP Reaction

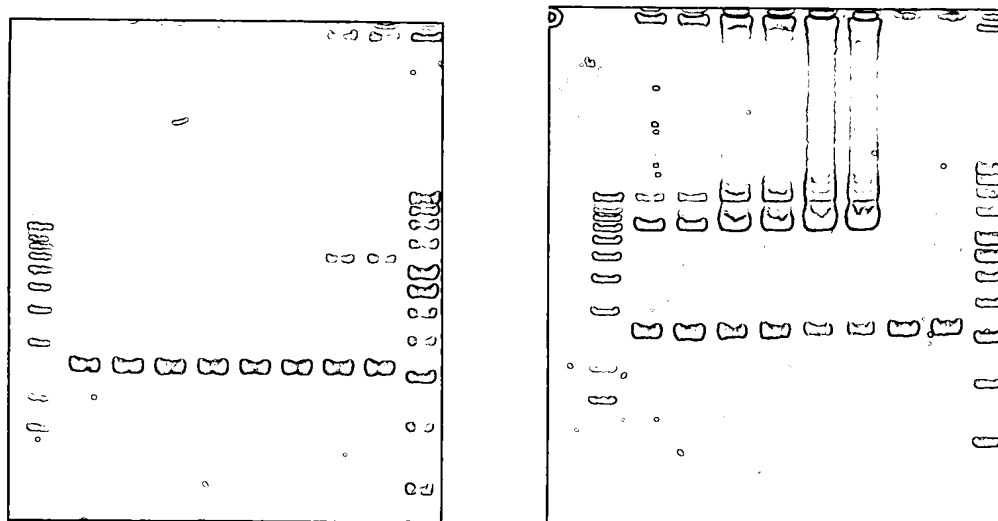


FIG.74

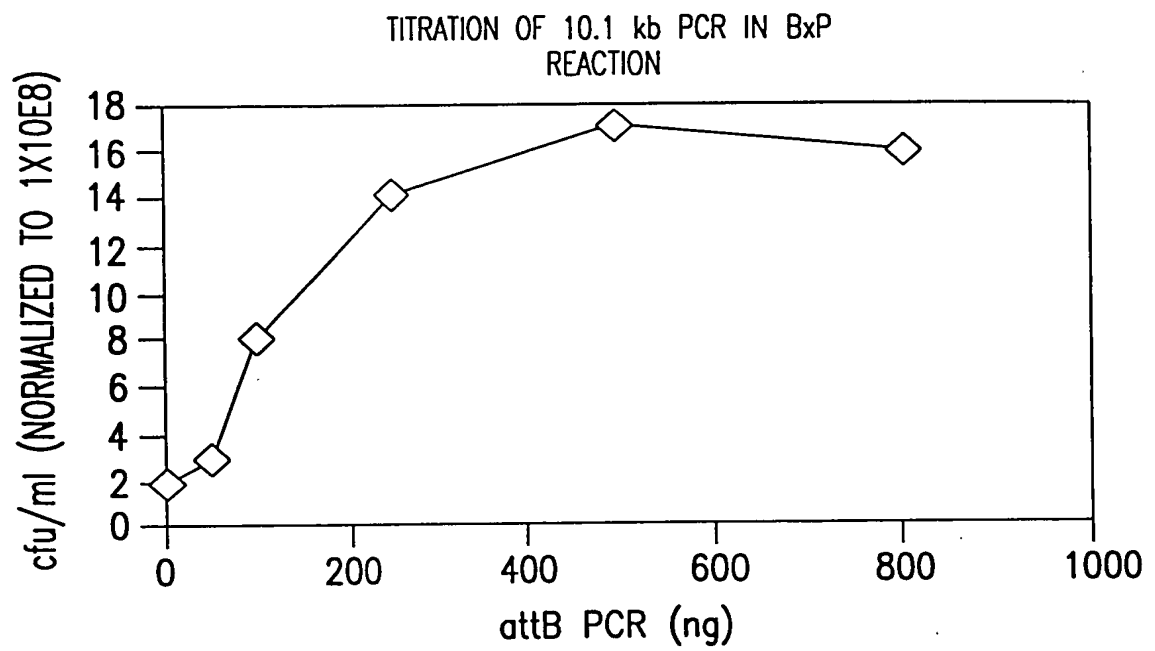


FIG.75

10.1 kb PCR DNA Titration in a BXP Reaction

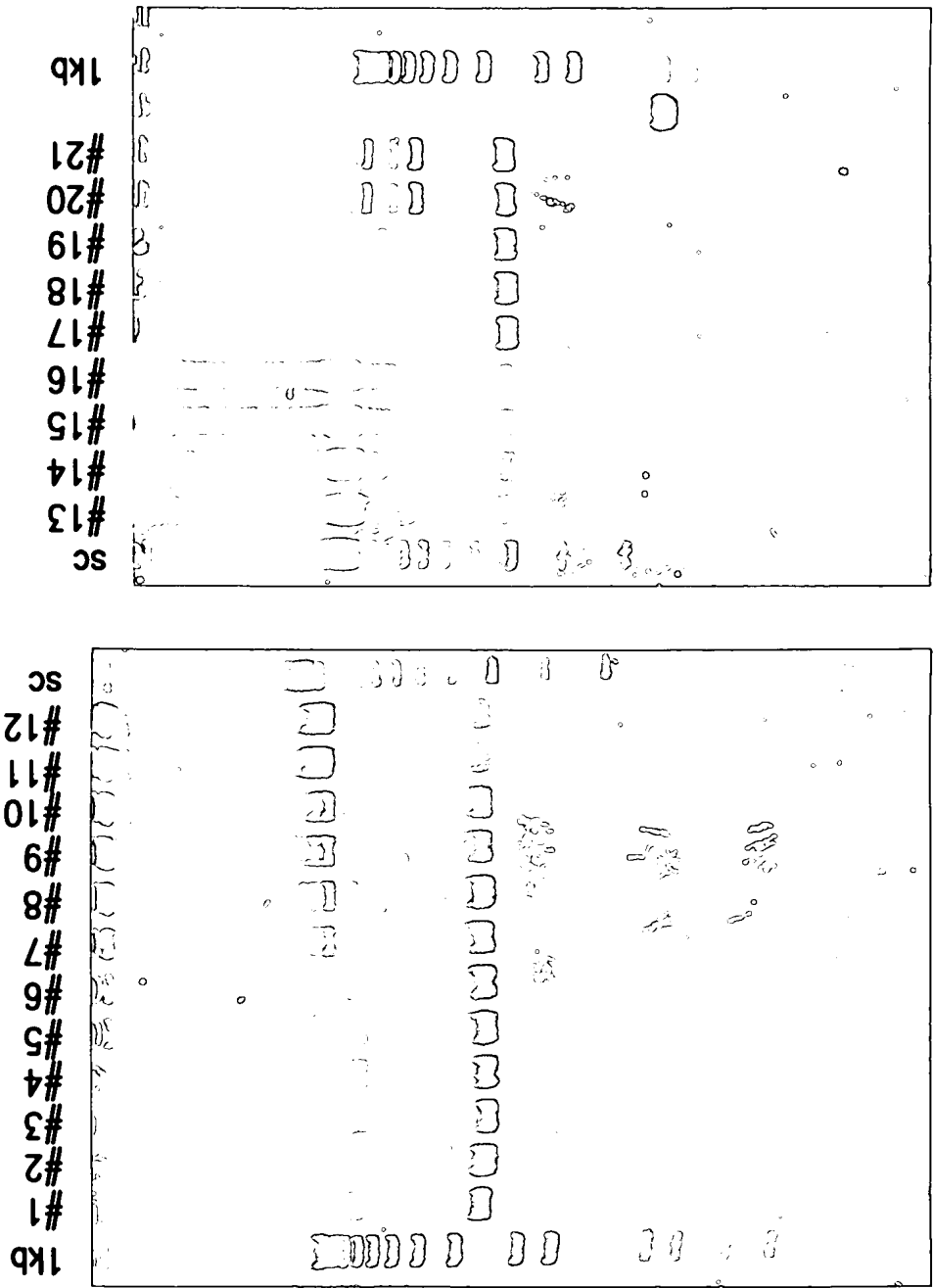


FIG.76

CLONING OF PCR PRODUCTS OF DIFFERENT SIZES WITH THE GATEWAY™ PCR CLONING SYSTEM				
SIZE	fmols PCR DNA	ng PCR DNA	Cols/ml TRANSFORMATION (pUC=10 ⁸ CFU/ml)	CORRECT CLONES/TOTAL EXAMINED **
0.26 kb *	15 37.5	3 7.5	1223 2815	10/10 (a)
1.0 kb	15 37.5	10 25	507 1447	49/50 (b)
1.4 kb	15 37.5	14 35	271 683	48/50 (c)
3.4 kb	15 37.5	34 85	478 976	9/10 (a)
4.6 kb	15 37.5	46 115	190 195	10/10 (a)
6.9 kb	15 37.5	69 173	30 (235)** 54 (463)**	47/50 (b)

* THE 0.26 kb PCR PRODUCT WAS USED UNPURIFIED; ALL THE OTHERS WERE PURIFIED BY PRECIPITATION WITH PEG/MgCl₂ AS DESCRIBED IN THE TEXT OF EXAMPLE 9, TO REMOVE PRIMER DIMERS POTENTIALLY PRESENT. STANDARD INCUBATIONS WERE FOR 60 MIN.

** OVERNIGHT INCUBATION

(a) DNA MINIPREPS
(b) ampR/kanR
(c) tetR/kanR

FIG.77

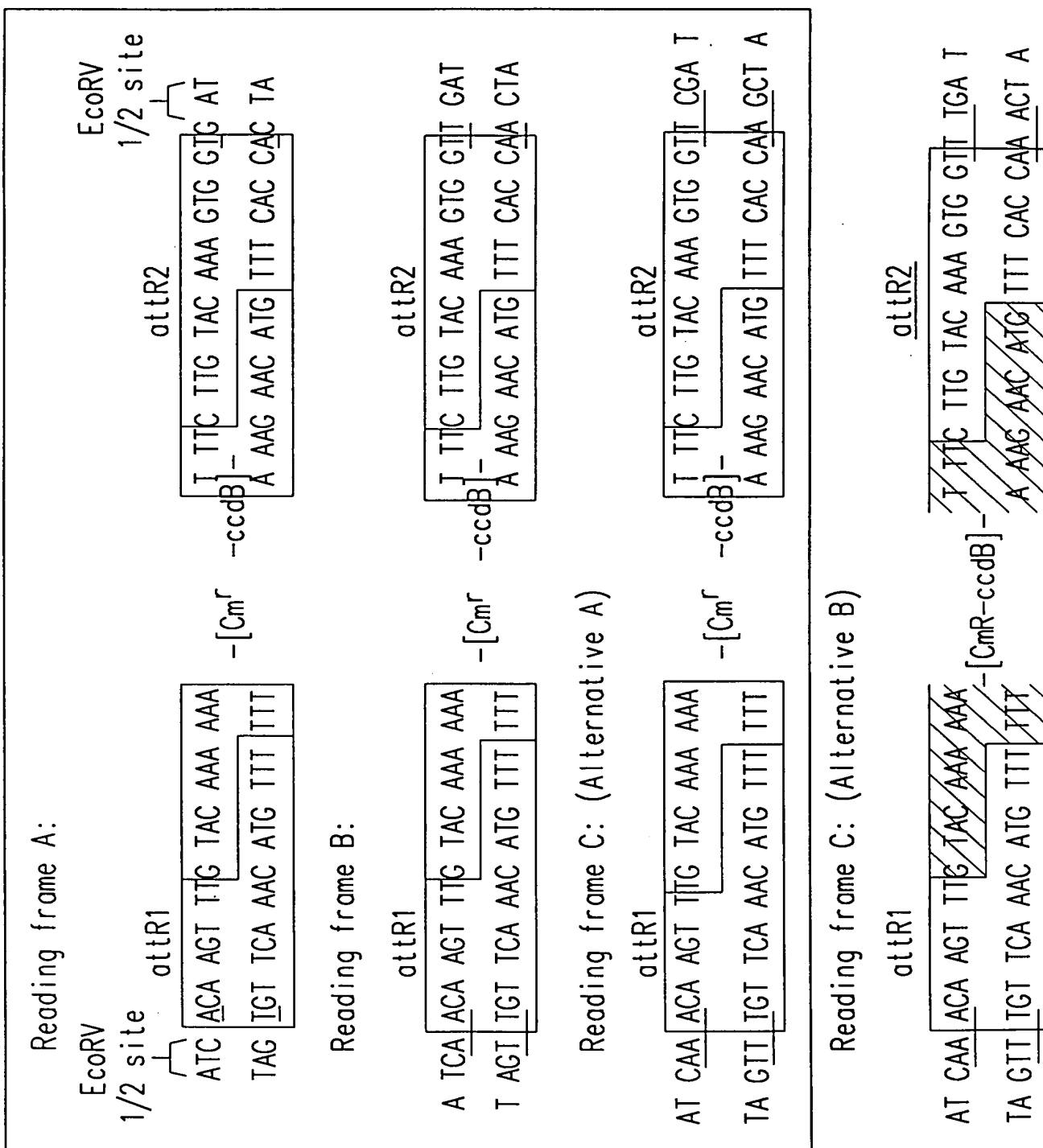


FIG. 78

Fusion protein

codon

Reading frame A cassette

---nnn nnn atc aca agt ttg tac aaa aaa gct ---
 ---nnn nnn tag tgt tca aac atg ttt ttt cga ---
 attR1

* Reading frame B cassette

---nnn nnn nna tca aca agt ttg tac aaa aaa gct ---
 ---nnn nnn nnt agt tgt tca aac atg ttt ttt cga ---

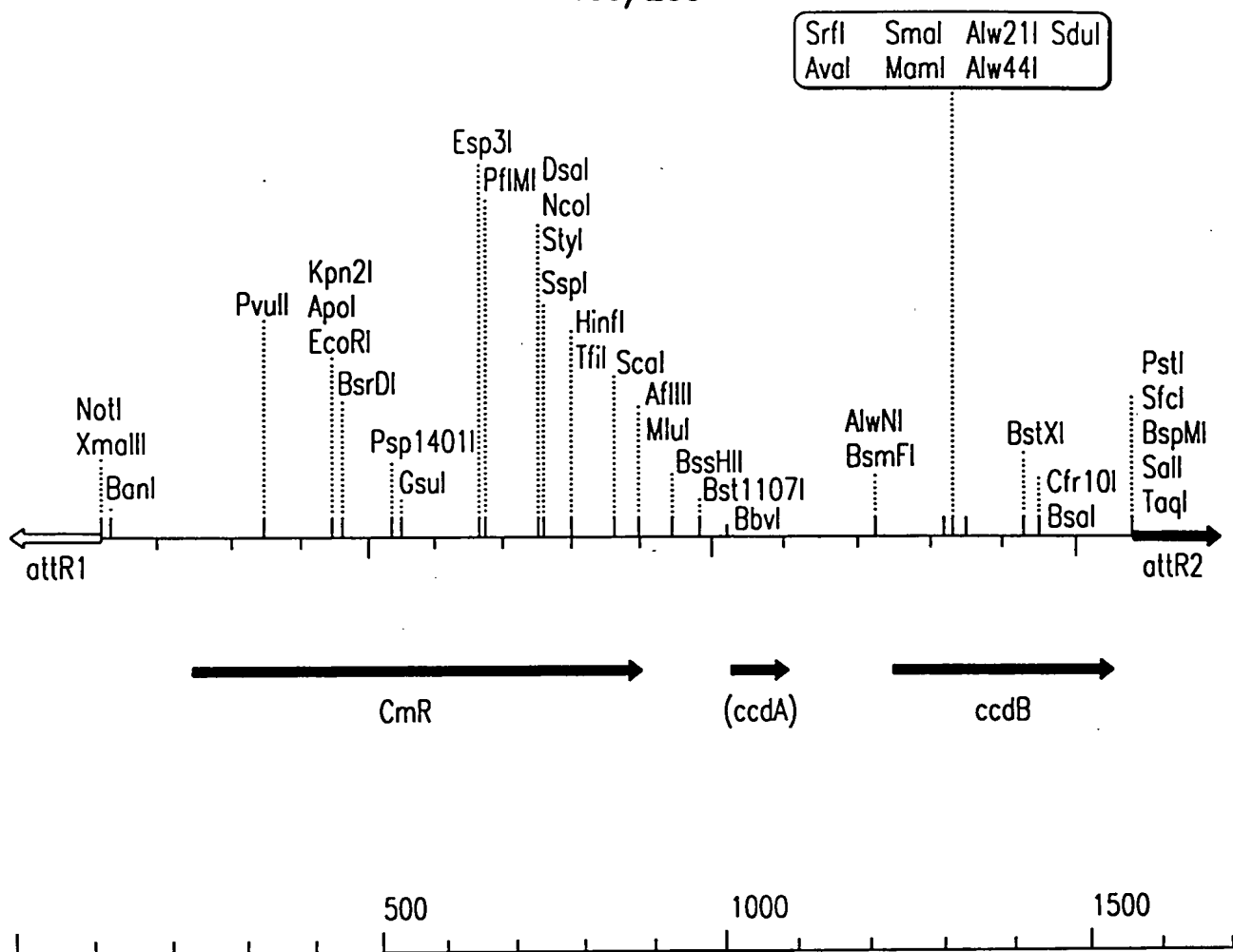
*cannot be TG or TA

Reading frame C cassette

---nnn nnn nat caa aca agt ttg tac aaa aaa gct ---
 ---nnn nnn nta gtt tgt tca aac atg ttt ttt cga ---

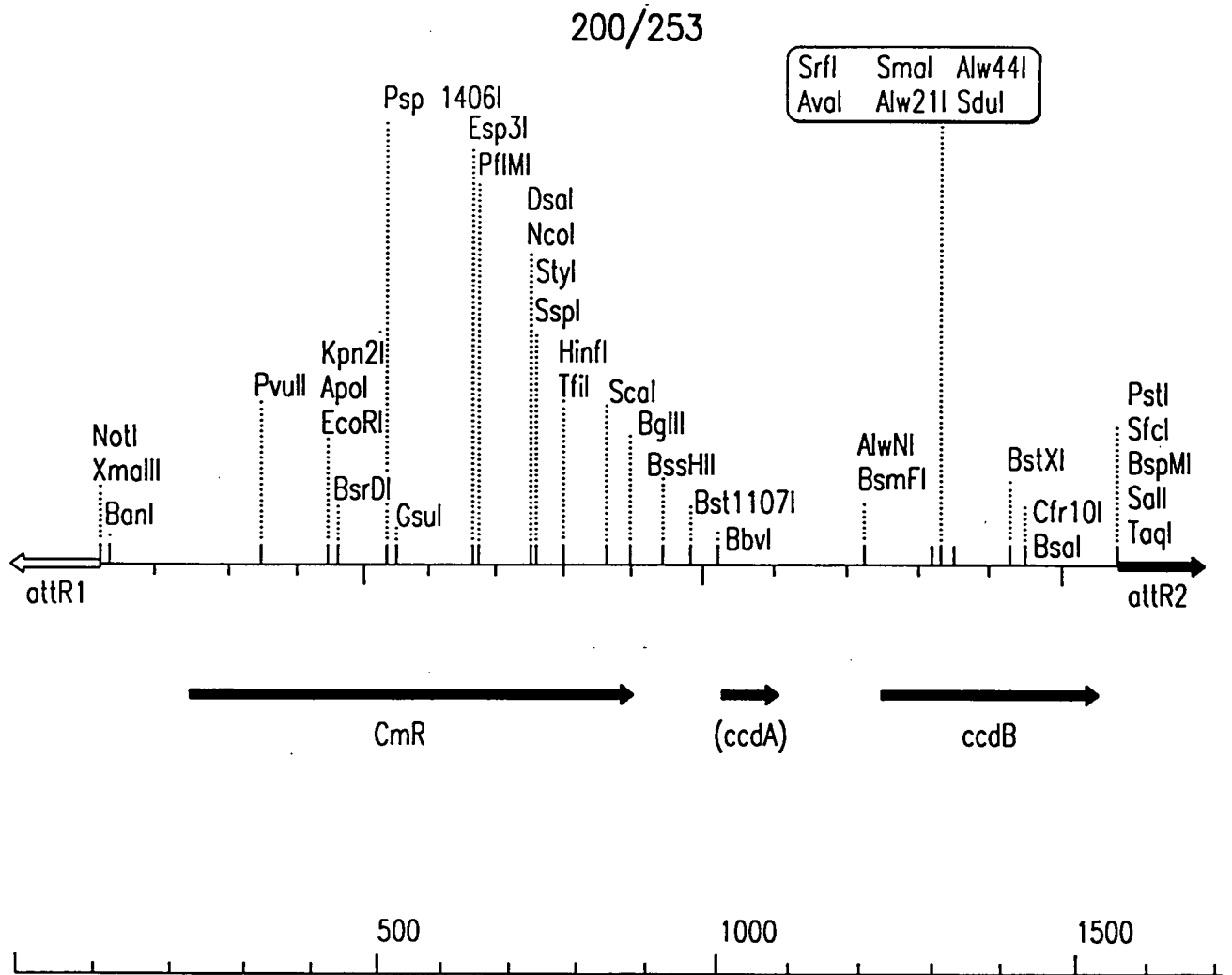
FIG.79

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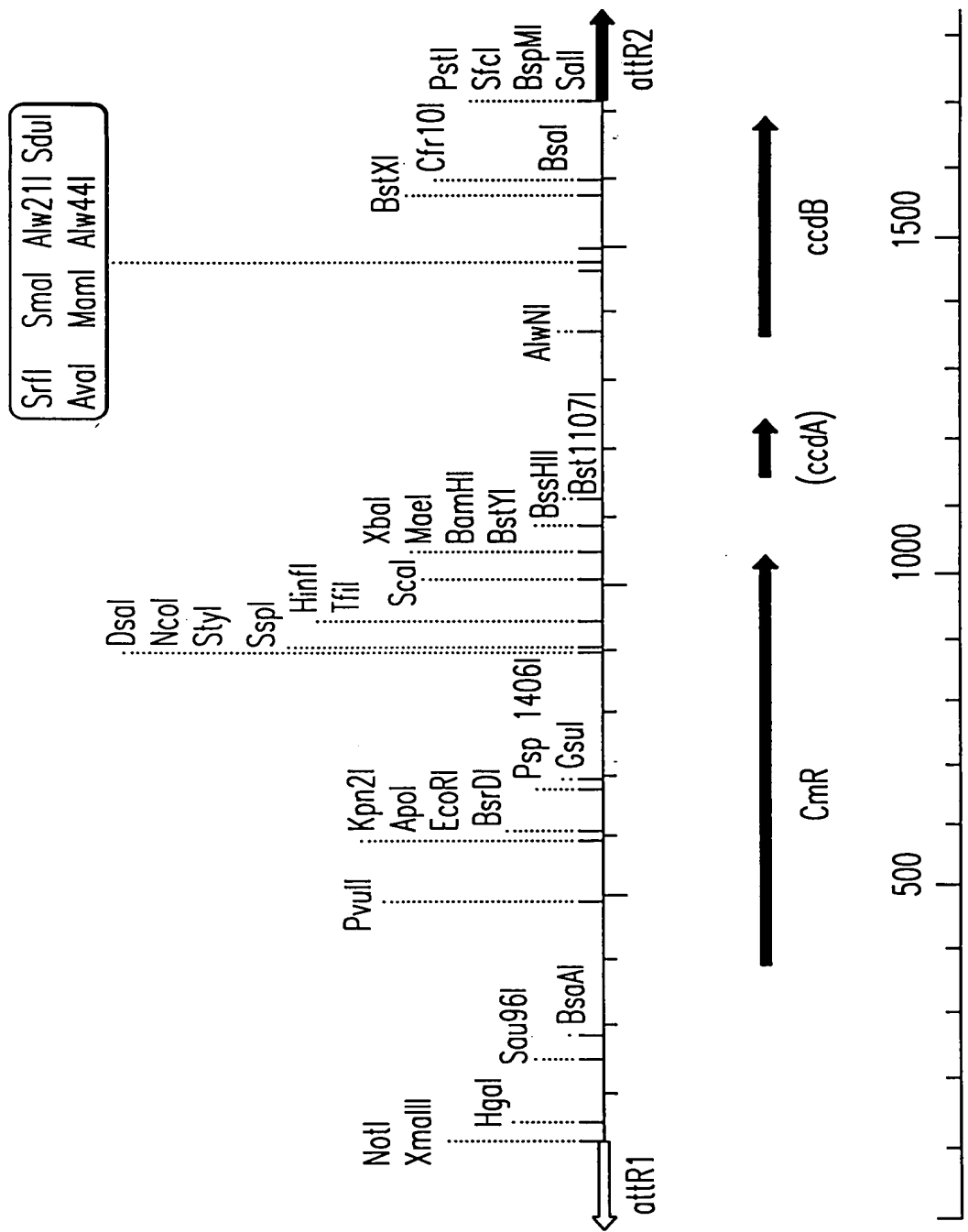
rfa CASSETTE (1711 bps)

FIG. 80



rB CASSETTE (1713 bps)

FIG.81



rfc CASSETTE (1856 bps)

FIG.82A

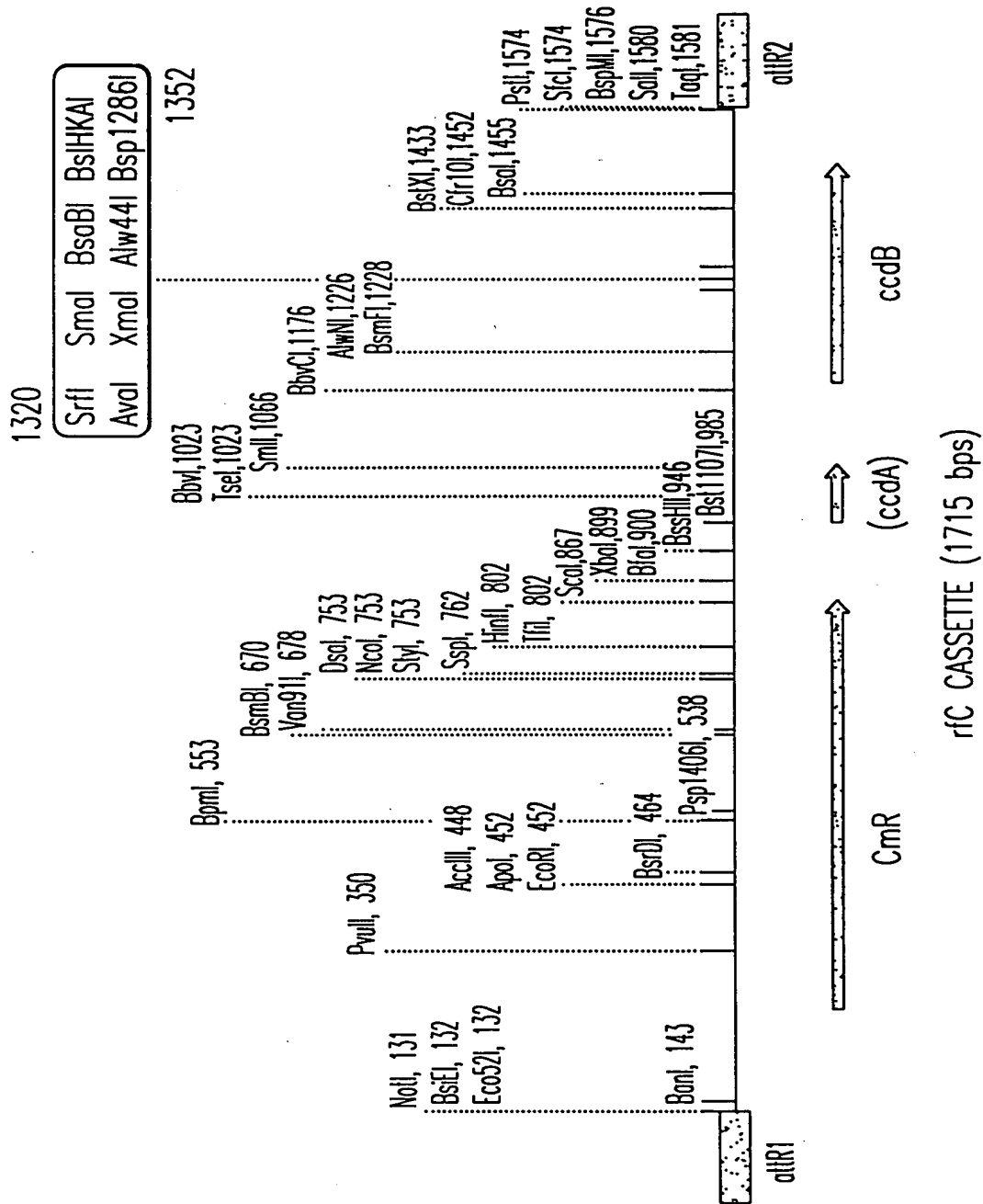


FIG. 82B

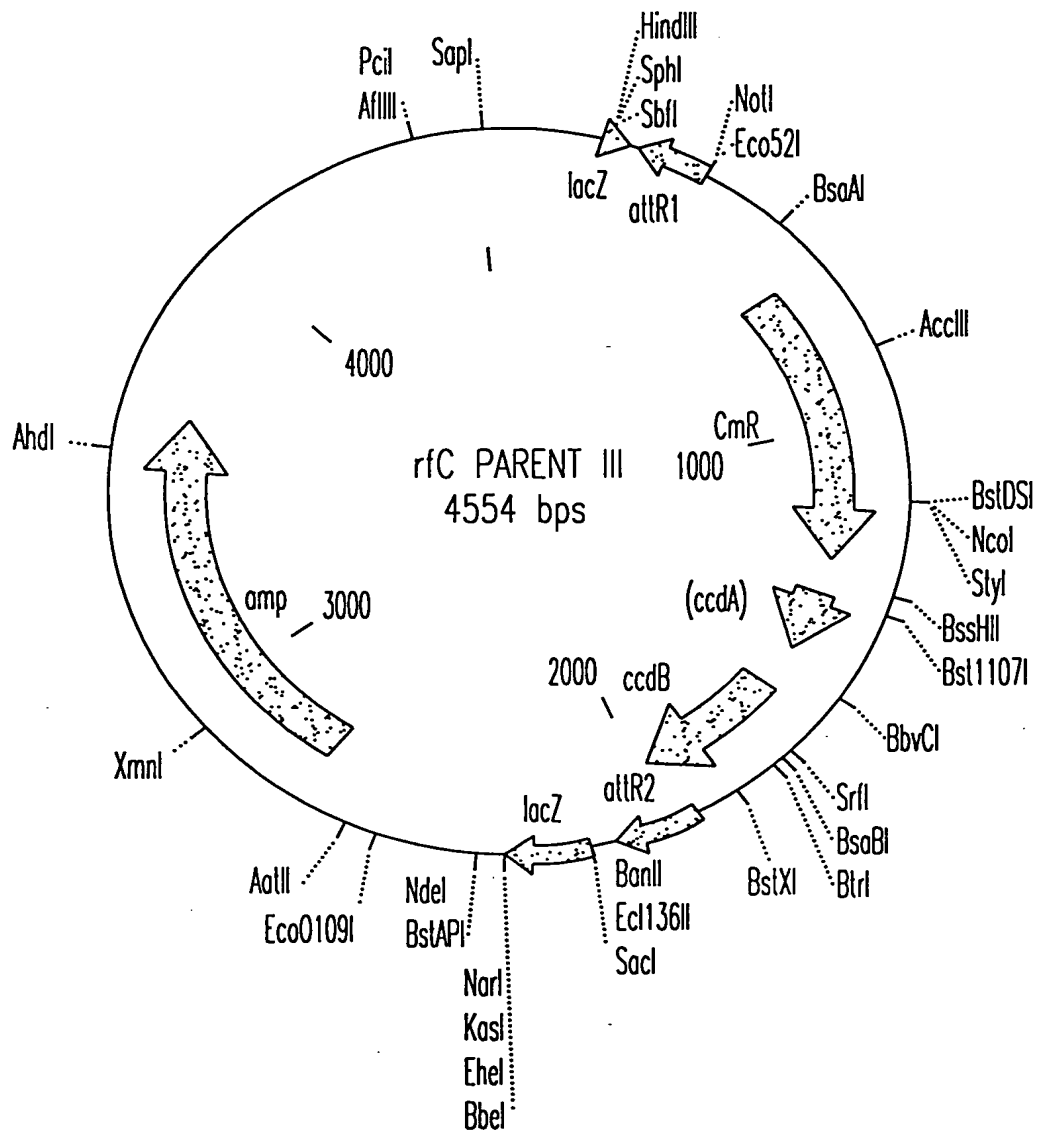


FIG. 83A

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prfC Parent III

4554 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
410..286	attR1
660..1319	CmR
1439..1523	inactivated ccdA
1661..1966	ccdB
2007..2131	attR2
2753..3613	amp

```

1 GCGCCCAATA CGCAAACCGC CTCTCCCCGC GCGTTGGCCG ATTCATTAAT GCAGCTGGCA
61 CGACAGGTTT CCCGACTGGA AAGCGGGCAG TGAGCGCAAC GCAATTAATG TGAGTTAGCT
121 CACTCATTAG GCACCCAGG CTTTACACTT TATGCTTCCG GCTCGTATGT TGTGTGGAAT
181 TGTGAGCGGA TAACAATTTC ACACAGGAAA CAGCTATGAC CATGATTACG CCAAGCTTGC
241 ATGCCTGCAG GTCGACTCTA GAGGATCCCC GGGTACCGAT ATCAAACAAG TTTGTACAAA
301 AAAGCTGAAC GAGAAACGTA AAATGATATA AATATCAATA TATTAAATTA GATTTTGCAT
361 AAAAAACAGA CTACATAATA CTGTAAAACA CAACATATCC AGTCACTATG GCGGCCGCTA
421 AGTTGGCAGC ATCACCCGAC GCACTTTGCG CCGAATAAAT ACCTGTGACG GAAGATCACT
481 TCGCAGAATA AATAAATCCT GGTGTCCCTG TTGATACCGG GAAGCCCTGG GCCAACTTTT
541 GGCGAAAATG AGACGTTGAT CGGCACGTAA GAGGTTCCAA CTTTCACCAT AATGAAATAA
601 GATCACTACC GGGCGTATTT TTTGAGTTAT CGAGATTTTC AGGAGCTAAG GAAGCTAAAA
661 TGGAGAAAAA AATCACTGGA TATACCACCG TTGATATATC CCAATGGCAT CGTAAAGAAC
721 ATTTTGAGGC ATTTTCAGTCA GTTGCTCAAT GTACCTATAA CCAGACCGTT CAGCTGGATA
781 TTACGGCCTT TTAAAGACC GTAAAGAAAA ATAAGCACAA GTTTTATCCG GCCTTTATTC
841 ACATTCTTGC CCGCCTGATG AATGCTCATC CGGAATTCCG TATGGCAATG AAAGACGGTG
901 AGCTGGTGAT ATGGGATAGT GTTACCCCTT GTTACACCGT TTTCCATGAG CAAACTGAAA
961 CGTTTTTCATC GCTCTGGAGT GAATACCACG ACGATTTCCG GCAGTTTCTA CACATATATT
1021 CGCAAGATGT GGCCTGTAC GGTGAAAACC TGGCCTATTT CCCTAAAGGG TTTATTGAGA
1081 ATATGTTTTT CGTCTCAGCC AATCCCTGGG TGAGTTTCAC CAGTTTTGAT TTAAACGTGG
1141 CCAATATGGA CAACTTCTTC GCCCCCGTTT TCACCATGGG CAAATATTAT ACGCAAGGCG
1201 ACAAGGTGCT GATGCCGCTG GCGATTACAG TTCATCATGC CGTCTGTGAT GGCTTCCATG
1261 TCGGCAGAAT GCTTAATGAA TTACAACAGT ACTGCGATGA GTGGCAGGGC GGGGCGTAAT
1321 CTAGAGGATC CGGCTTACTA AAAGCCAGAT AACAGTATGC GTATTTGCGC GCTGATTTTT
1381 GCGGTATAAG AATATATACT GATATGTATA CCCGAAGTAT GTCAAAAAGA GGTGTGCTAT
1441 GAAGCAGCGT ATTACAGTGA CAGTTGACAG CGACAGCTAT CAGTTGCTCA AGGCATATAT
1501 GATGTCAATA TCTCCGGTCT GGTAAGCACA ACCATGCAGA ATGAAGCCCG TCGTCTGCGT
1561 GCCGAACGCT GGAAAGCGGA AAATCAGGAA GGGATGGCTG AGGTCGCCCG GTTTATTGAA
1621 ATGAACGGCT CTTTTGCTGA CGAGAACAGG GACTGGTGAA ATGCAGTTTA AGGTTTACAC
1681 CTATAAAAGA GAGAGCCGTT ATCGTCTGTT TGTGGATGTA CAGAGTGATA TTATTGACAC
1741 GCCCGGGCGA CGGATGGTGA TCCCCTGGC CAGTGCACGT CTGCTGTCAG ATAAAGTCTC
1801 CCGTGAACCT TACCCGGTGG TGCATATCGG GGATGAAAGC TGGCGCATGA TGACCACCGA
1861 TATGGCCAGT GTGCCGGTCT CCGTTATCGG GGAAGAAGTG GCTGATCTCA GCCACCGCGA
1921 AAATGACATC AAAAACGCCA TTAACCTGAT GTTCTGGGGA ATATAAATGT CAGGCTCCGT
1981 TATACACAGC CAGTCTGCAG GTCGACCATA GTGACTGGAT ATGTTGTGTT TTACAGTATT
2041 ATGTAGTCTG TTTTTTATGC AAAATCTAAT TTAATATATT GATATTTATA TCATTTTACG

```

FIG.83B

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2101	TTTCTCGTTC	AGCTTTCTTG	TACAAAGTGG	TTCGATATCG	GTACCGAGCT	CGAATTCACT
2161	GGCCGTCGTT	TTACAACGTC	GTGACTGGGA	AAACCCTGGC	GTTACCCAAC	TTAATCGCCT
2221	TGCAGCACAT	CCCCCTTTCG	CCAGCTGGCG	TAATAGCGAA	GAGGCCCGCA	CCGATCGCCC
2281	TTCCCAACAG	TTGCGCAGCC	TGAATGGCGA	ATGGCGCCTG	ATGCGGTATT	TTCTCCTTAC
2341	GCATCTGTGC	GGTATTTTAC	ACCGCATATG	GTGCACTCTC	AGTACAATCT	GCTCTGATGC
2401	CGCATAGTTA	AGCCAGCCCC	GACACCCGCC	AACACCCGCT	GACGCGCCCT	GACGGGCTTG
2461	TCTGCTCCCG	GCATCCGCTT	ACAGACAAGC	TGTGACCGTC	TCCGGGAGCT	GCATGTGTCA
2521	GAGGTTTTCA	CCGTCATCAC	CGAAACGCGC	GAGACGAAAG	GGCCTCGTGA	TACGCCTATT
2581	TTTATAGGTT	AATGTCATGA	TAATAATGGT	TTCTTAGACG	TCAGGTGGCA	CTTTTCGGGG
2641	AAATGTGCGC	GGAACCCCTA	TTTGTATTATT	TTTCTAAATA	CATTCAAATA	TGTATCCGCT
2701	CATGAGACAA	TAACCCTGAT	AAATGCTTCA	ATAATATTGA	AAAAGGAAGA	GTATGAGTAT
2761	TCAACATTTT	CGTGTGCGCC	TTATTCCCTT	TTTTGCGGCA	TTTTGCCTTC	CTGTTTTTGC
2821	TCACCCAGAA	ACGCTGGTGA	AAGTAAAGA	TGCTGAAGAT	CAGTTGGGTG	CACGAGTGGG
2881	TTACATCGAA	CTGGATCTCA	ACAGCGGTAA	GATCCTTGAG	AGTTTTCGCC	CCGAAGAACG
2941	TTTTCCAATG	ATGAGCACTT	TTAAAGTTCT	GCTATGTGGC	GCGGTATTAT	CCCGTATTGA
3001	CGCCGGGCAA	GAGCAACTCG	GTCGCCGCAT	ACACTATTCT	CAGAATGACT	TGGTTGAGTA
3061	CTCACCAGTC	ACAGAAAAGC	ATCTTACGGA	TGGCATGACA	GTAAGAGAAT	TATGCAGTGC
3121	TGCCATAACC	ATGAGTGATA	ACACTGCGGC	CAACTTACTT	CTGACAACGA	TCGGAGGACC
3181	GAAGGAGCTA	ACCGCTTTTT	TGCACAACAT	GGGGGATCAT	GTAAGTCGCC	TTGATCGTTG
3241	GGAACCGGAG	CTGAATGAAG	CCATACCAAA	CGACGAGCGT	GACACCACGA	TGCCTGTAGC
3301	AATGGCAACA	ACGTTGCGCA	AACTATTAAC	TGGCGAACTA	CTTACTCTAG	CTTCCCGGCA
3361	ACAATTAATA	GACTGGATGG	AGGCGGATAA	AGTTGCAGGA	CCACTTCTGC	GCTCGGCCCT
3421	TCCGGCTGGC	TGGTTTATTG	CTGATAAATC	TGGAGCCGGT	GAGCGTGGGT	CTCGCGGTAT
3481	CATTGCAGCA	CTGGGGCCAG	ATGGTAAGCC	CTCCCGTATC	GTAGTTATCT	ACACGACGGG
3541	GAGTCAGGCA	ACTATGGATG	AACGAAATAG	ACAGATCGCT	GAGATAGGTG	CCTCACTGAT
3601	TAAGCATTGG	TAAGTGTGAG	ACCAAGTTTA	CTCATATATA	CTTTAGATTG	ATTTAAAACT
3661	TCATTTTTAA	TTTAAAAGGA	TCTAGGTGAA	GATCCTTTTT	GATAATCTCA	TGACCAAAAT
3721	CCCTTAACGT	GAGTTTTTCG	TCCACTGAGC	GTCAGACCCC	GTAAGAAAAG	TCAAAGGATC
3781	TTCTTGAGAT	CCTTTTTTTC	TGCGCGTAAT	CTGCTGCTTG	CAAACAAAAA	AACCACCGCT
3841	ACCAGCGGTG	GTTTGTTTGC	CGGATCAAGA	GCTACCAACT	CTTTTTCCGA	AGGTAAGTGG
3901	CTTCAGCAGA	GCGCAGATAC	CAAATACTGT	CCTTCTAGTG	TAGCCGTAGT	TAGGCCACCA
3961	CTTCAAGAAC	TCTGTAGCAC	CGCCTACATA	CCTCGCTCTG	CTAATCCTGT	TACCAGTGGC
4021	TGCTGCCAGT	GGCGATAAGT	CGTGTCTTAC	CGGGTTGGAC	TCAAGACGAT	AGTTACCGGA
4081	TAAGGCGCAG	CGGTCGGGCT	GAACGGGGGG	TTCGTGCACA	CAGCCCAGCT	TGGAGCGAAC
4141	GACCTACACC	GAAGTGTGAT	ACCTACAGCG	TGAGCTATGA	GAAAGCGCCA	CGCTTCCCGA
4201	AGGGAGAAAG	GCGGACAGGT	ATCCGGTAAG	CGGCAGGGTC	GGAACAGGAG	AGCGCACGAG
4261	GGAGCTTCCA	GGGGGAAACG	CCTGGTATCT	TTATAGTCCT	GTCGGGTTTC	GCCACCTCTG
4321	ACTTGAGCGT	CGATTTTTGT	GATGCTCGTC	AGGGGGGCGG	AGCCTATGGA	AAAACGCCAG
4381	CAACGCGGCC	TTTTTACGGT	TCCTGGCCTT	TTGCTGGCCT	TTTGCTCACA	TGTTCTTTCC
4441	TGCGTTATCC	CCTGATTCTG	TGGATAACCG	TATTACCGCC	TTTGAGTGAG	CTGATACCGC
4501	TCGCCGCAGC	CGAACGACCG	AGCGCAGCGA	GTCAGTGAGC	GAGGAAGCGG	AAGA

FIG.83C

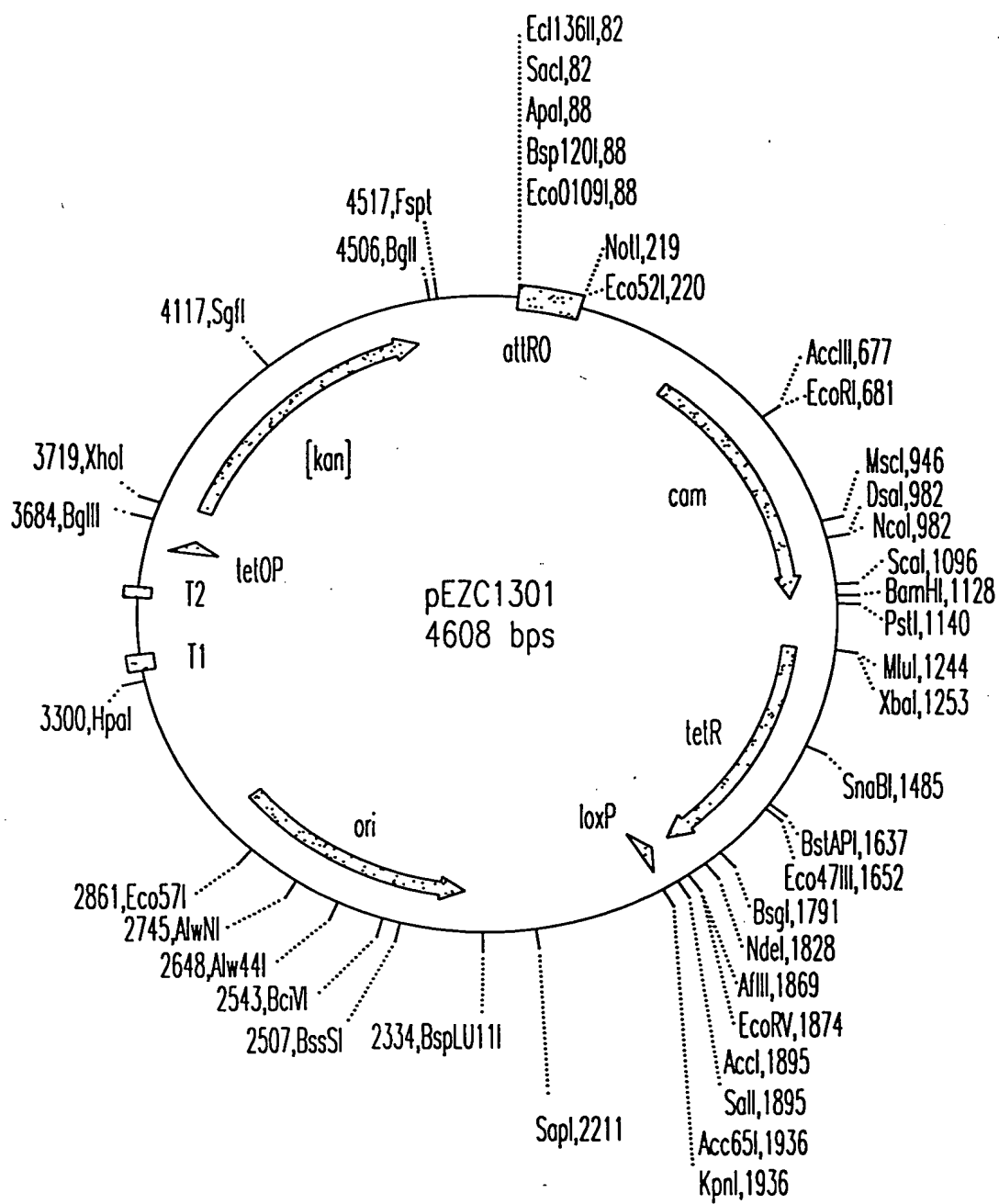


FIG. 84

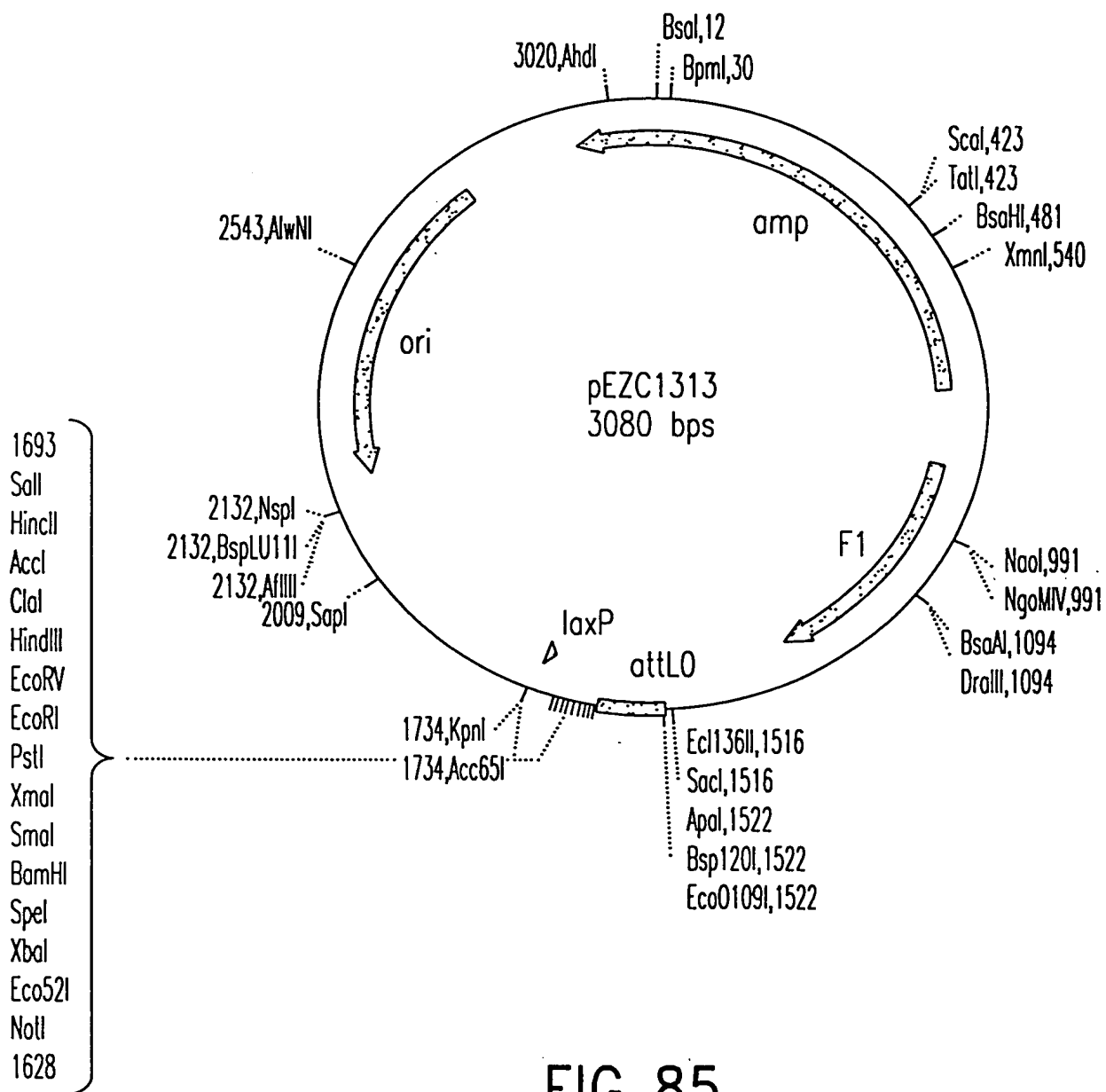


FIG. 85

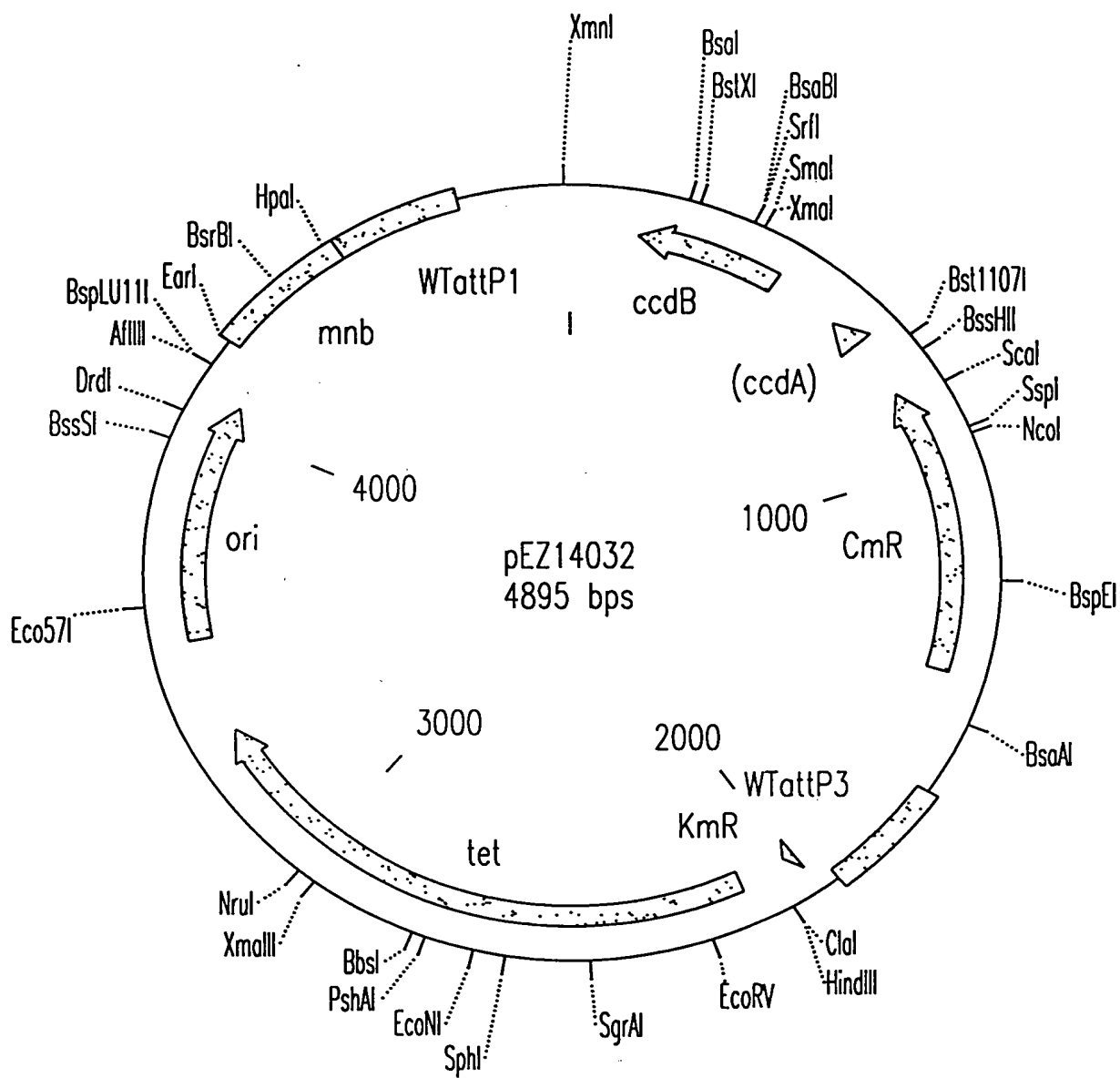


FIG.86

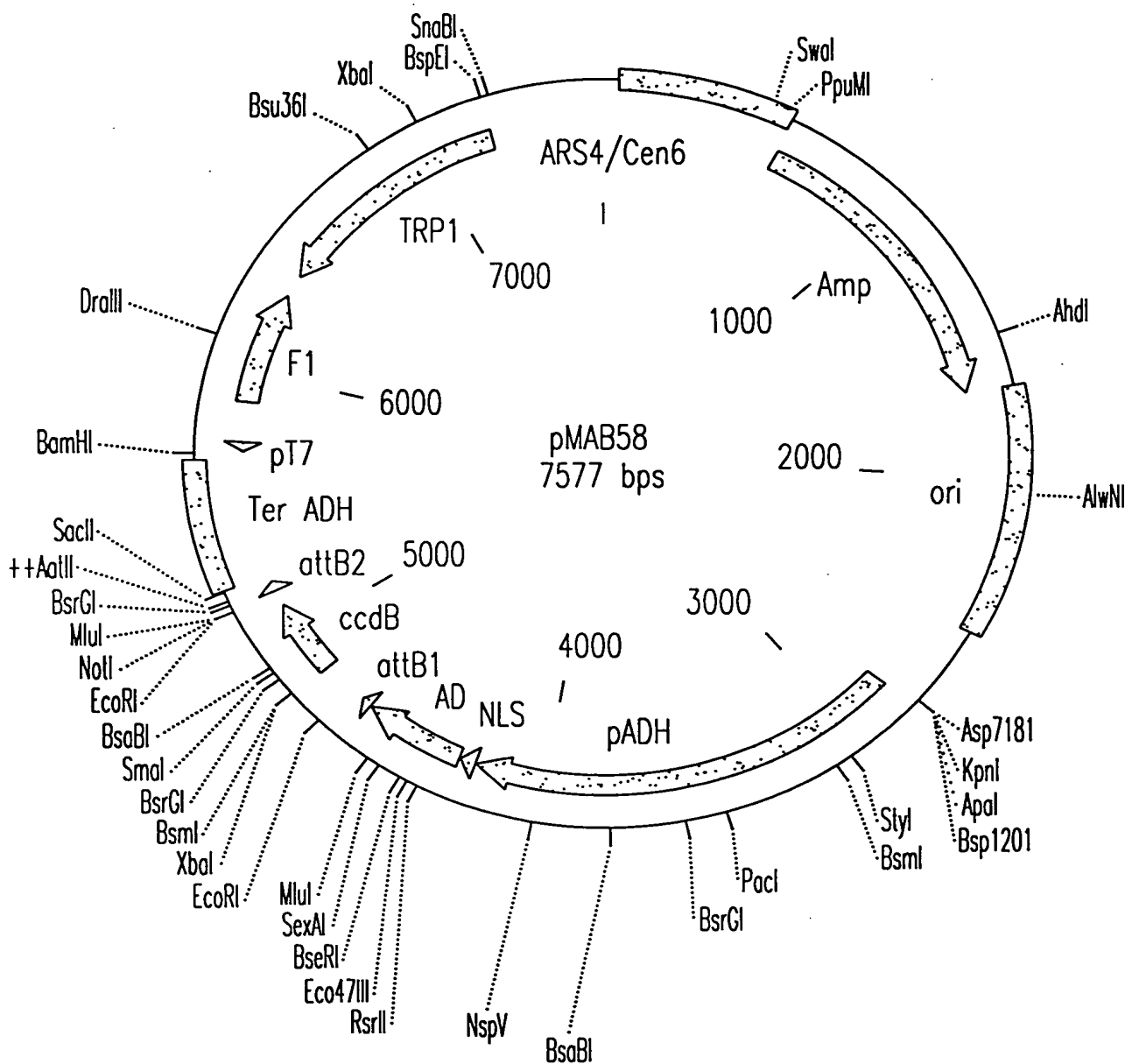


FIG.87

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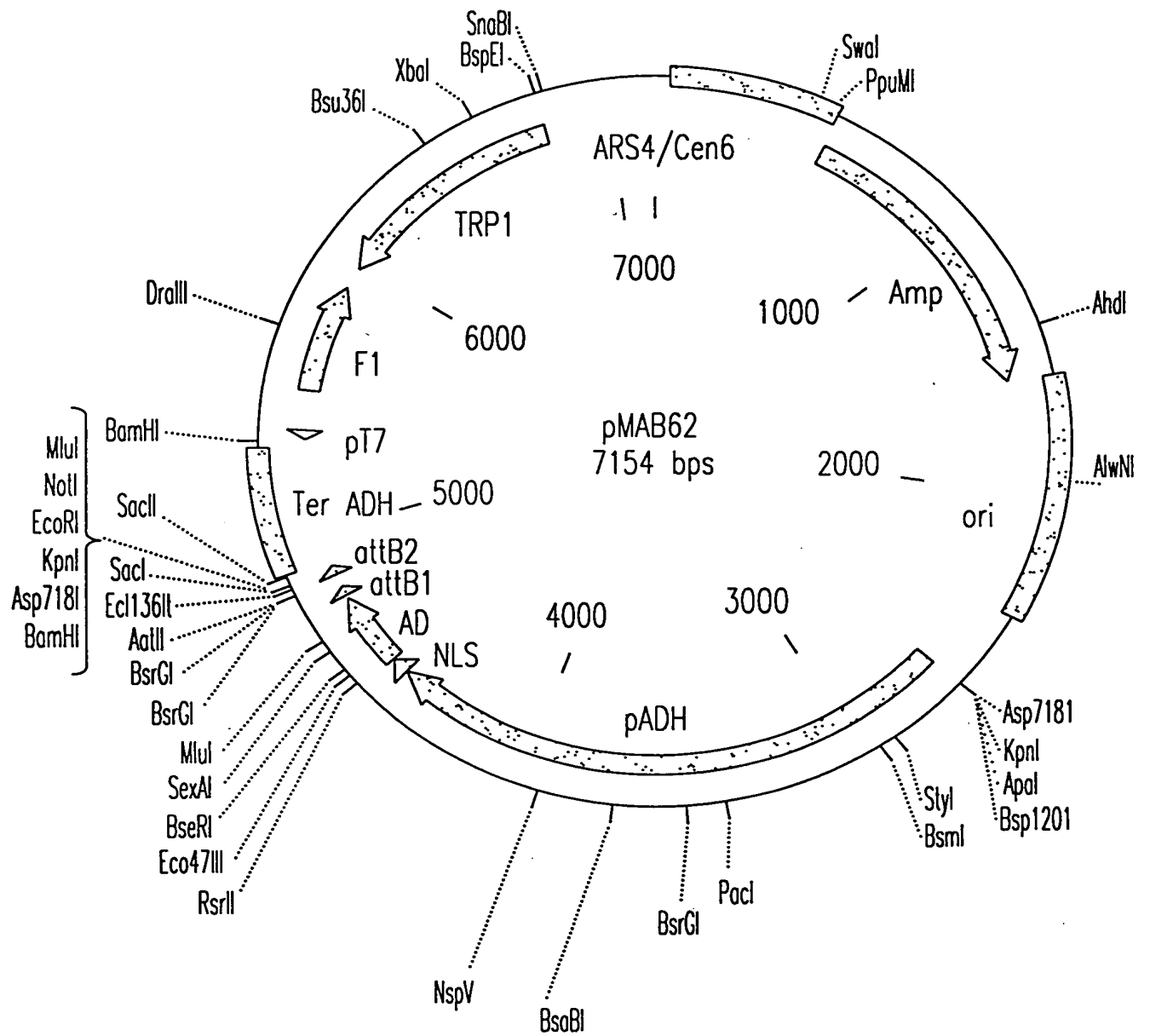


FIG.88

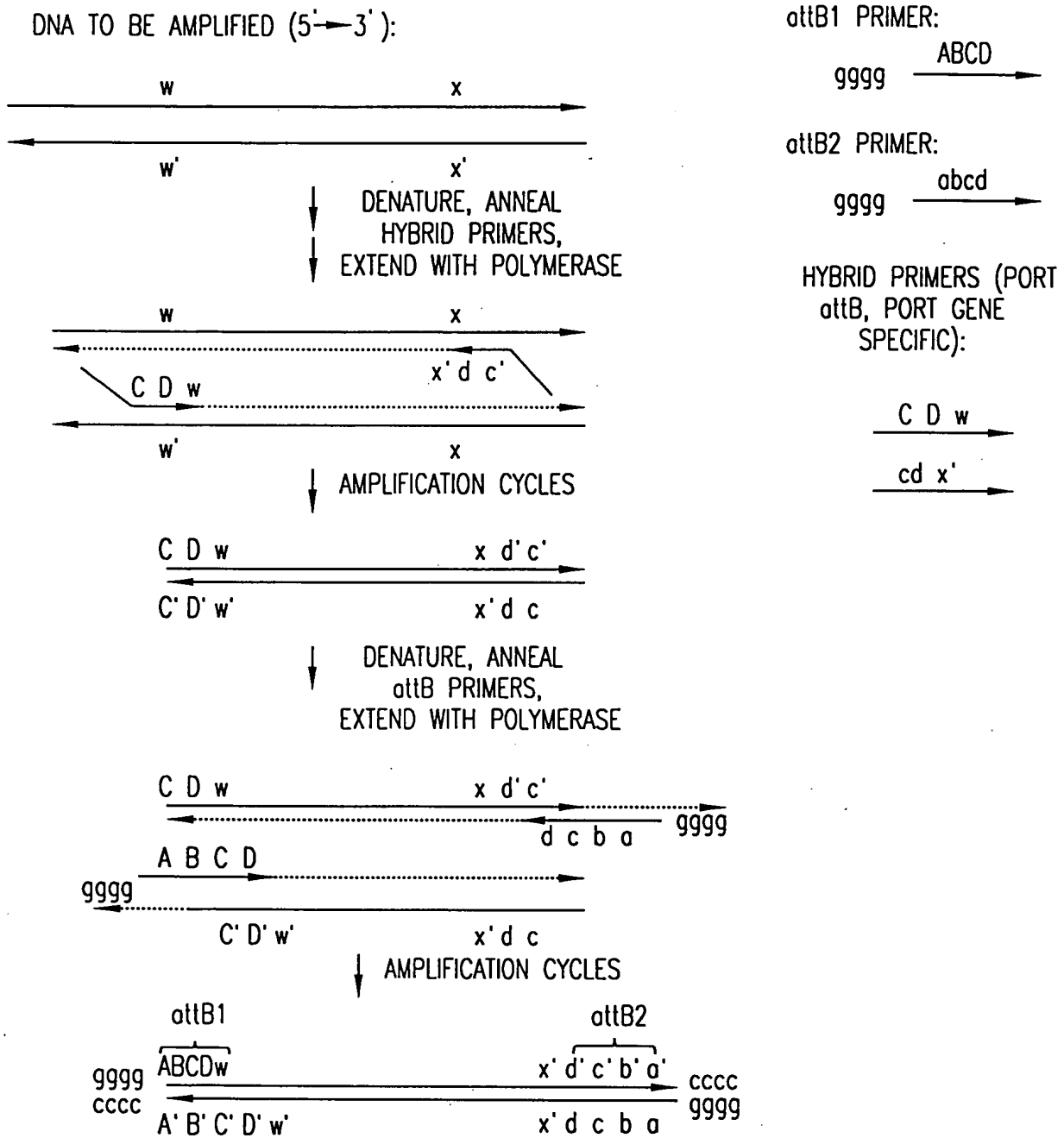


FIG. 89

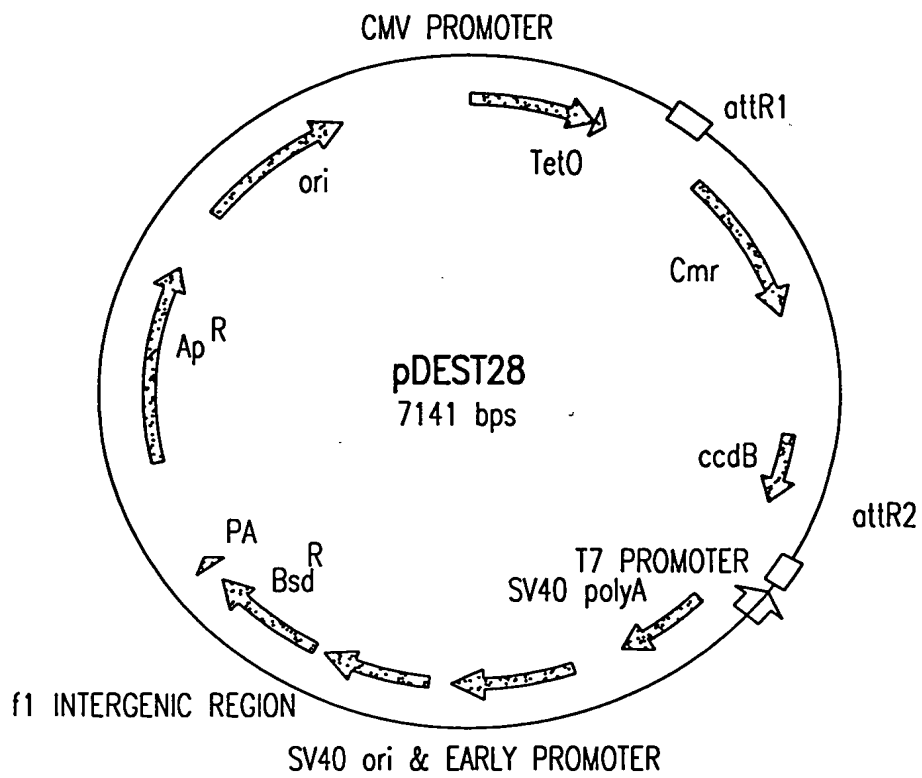


FIG.90A

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pDEST28 7141 bp

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCC
CGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGAC
TCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAA
AATCAACGGGACTTTCCAAAATGTCGTAACAACCTCCGCCCATTGACGCAAATGGGCGGT
AGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACT
CTAGAGGATCCCTACCGGTGATATCCTCGAGCCCATCAACAAGTTTGTACAAAAAAGCTG
AACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCATAAAAAAC
AGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGGCGGCCGCATTAGGCAC
CCCAGGCTTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGGATTTTGTAGTTAGGATCC
GGCGAGATTTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACCAC
CGTTGATATATCCCAATGGCATCGTAAGAACATTTTGAGGCATTTTCAGTCAGTTGCTCA
ATGTACCTATAACCAGACCGTTTCAGCTGGATATTACGGCCTTTTTTAAAGACCGTAAAGAA
AAATAAGCACAAGTTTTATCCGGCCTTTATTCACATTCTTGCCCGCCTGATGAATGCTCA
TCCGGAATTCGGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTACCCC
TTGTTACACCGTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGCTCTGGAGTGAATACCA
CGACGATTTCCGGCAGTTTCTACACATATATTCGCAAGATGTGGCGTGTTACGGTGAAAA
CCTGGCCTATTTCCCTAAAGGGTTTTATTGAGAATATGTTTTTCGTCTCAGCCAATCCCTG
GGTGAGTTTTCACAGTTTTTGATTTAAACGTGGCCAATATGGACAACCTTTCGCCCCCGT
TTTCACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTCA
GGTTCATCATGCCGTCTGTGATGGCTTCCATGTGCGGCAGAATGCTTAATGAATTACAACA
GTACTGCGATGAGTGGCAGGGCGGGGCGTAAAGATCTGGATCCGGCTTACTAAAAGCCAG
ATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAATATATACTGATATGTA
TACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGAC
AGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCA
CAACCATGCAGAATGAAGCCCGTCGTCTGCGTGCCGAACGCTGGAAAGCGGAAAATCAGG
AAGGGATGGCTGAGGTGCCCCGTTTTATTGAAATGAACGGCTCTTTTGCTGACGAGAACA
GGGACTGGTGAAATGCAGTTTAAGTTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTG
TTTGTGGATGTACAGAGTGATATTATTGACACGCCCGGGCGACGGATGGTGATCCCCCTG
GCCAGTGACGTCTGCTGTGATGATAAAGTCTCCCGTGAACTTTACCCGGTGGTGATATC
GGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGGTCTCCGTTATC
GGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTG
ATGTTCTGGGGAATATAAATGTCAGGCTCCCTTATACACAGCCAGTCTGCAGGTGACCA

FIG.90B

TAGTGA CTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTA
 ATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTCAGCTTTCTTGTACAAAGT
 GGTGATGGGCGGCCGCTCTAGAGGGCCCAAGCTTACGCGTGCATGCGACGTCATAGCTC
 TCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGTTTTACAACGTCGTGA
 CTGGGAAAAC TGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTTCTGTGGTGTGACATA
 ATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATATAAAATTTTTAAGTGT
 ATAATGTGTTAAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTTGCTTACTGAGTATGA
 TTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTGTGTATTTTAGATTCA
 CAGTCCCAAGGCTCATTT CAGGCCCTCAGTCTCACAGTCTGTT CATGATCATAATCAG
 CCATACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTCCACACCTCCCCCTGAA
 CCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTATTGCAGCTTATAATGG
 TTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTTCACTGCATTC
 TAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCGATCCTGCATT
 AATGAATCGGCCAACGCGCGGGGAGAGGCGGTTT GCGTATTGGCTGGCGTAATAGCGAAG
 AGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGGACGCGC
 CCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACAC
 TTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCTTCTCGCCACGTTCG
 CCGGCTTTCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTCCGATTTAGTGCTT
 TACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGC
 CCTGATAGACGGTTTTTCGCCCTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCT
 TGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGA
 TTTTGCCGATTTTCGGCCTATTGGTTAAAAATGAGCTGATTTAACAAATATTTAACGCGA
 ATTTTAACAAATATTAACGTTTACAATTTCGCCTGATGCGGTATTTTCTCCTTACGCAT
 CTGTGCGGTATTTACACCGCATACGCGGATCTGCGCAGCACCATGGCCTGAAATAACCT
 CTGAAAGAGGAAC TTGGTTAGGTACCTTCTGAGGCGGAAAGAACCAGCTGTGGAATGTGT
 GTCAGTTAGGGTGTGGAAAGTCCCAGGCTCCCAGCAGGCAGAAGTATGCAAAGCATGC
 ATCTCAATTAGTCAGCAACCAGGTGTGGAAAGTCCCAGGCTCCCAGCAGGCAGAAGTA
 TGCAAAGCATGCATCTCAATTAGTCAGCAACCATAGTCCCGCCCCTAACTCCGCCCATCC
 CGCCCCTAACTCCGCCCAGTTCCGCCATTCTCCGCCCATGGCTGACTAATTTTTTTTA
 TTTATGCAGAGGCCGAGGCCGCTCGGCCTCTGAGCTATTCCAGAAGTAGTGAGGAGGCT
 TTTTGGAGGCCTAGGCTTTTGCAAAAAGCTTGATTCTTCTGACACAACAGTCTCGAACT
 TAAGACCATGGCCAAGCCTTTGTCTCAAGAAGAATCCACCCTCATTGAAAGAGCAACGGC
 TACAATCAACAGCATCCCATCTCTGAAGACTACAGCGTCGCCAGCGCAGCTCTCTCTAG
 CGACGGCCGCATCTTCACTGGTGTCAATGTATATCATTTTACTGGGGGACCTTGTGCAGA
 ACTCGTGGTGTGCTGGGCACTGCTGCTGCTGCGGCAGCTGGCAACCTGACTTGTATCGTCGC
 GATCGGAAATGAGAACAGGGGCATCTTGAGCCCCTGCGGACGGTGCCGACAGGTGCTTCT
 CGATCTGCATCCTGGGATCAAAGCCATAGTGAAGGACAGTGATGGACAGCCGACGGCAGT
 TGGGATTCGTGAATTGCTGCCCTCTGGTTATGTGTGGGAGGGCTAAGCACTTCGTGGCCG
 AGTTGAAATGACCGACCAAGCGACGCCAACCTGCCATCACGATGGCCGCAATAAAATA
 TCTTTATTTTCATTACATCTGTGTGTTGGTTTTTTGTGTGAATCGATAGCGATAAGGATC
 CGCGTATGGTGCACCTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGA

FIG.90C

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CACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTAC
AGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGGTTTTACCGTCATCACCG
AAACGCGCGAGACGAAAGGGCCTCGTGATACGCCATTTTTATAGGTTAATGTCATGATA
ATAATGGTTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATT
TGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAA
ATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCGCCTT
ATTCCCTTTTTTGCGGCATTTTGCTTCCTGTTTTTGCTCACCCAGAAACGCTGGTGAAA
GTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTCAAC
AGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTT
AAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGT
CGCCGCATACACTATTCTCAGAATGACTTGTTGAGTACTACCAGTCACAGAAAAGCAT
CTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAAC
ACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTG
CACAACATGGGGGATCATGTAACTCGCTTGATCGTTGGGAACCGGAGCTGAATGAAGCC
ATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAA
CTATTAACCTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAAGACTGGATGGAG
GCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCT
GATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGAT
GGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAA
CGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACGTGTCAGAC
CAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTTAATTTAAAGGATC
TAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTTC
CACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTG
CGCGTAATCTGCTGCTTGCAAACAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCG
GATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATACCA
AATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCG
CCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCG
TGTCTTACCGGGTTGGA CTCAAGACGATAGTTACCGGATAAAGGCGCAGCGGTGCGGCTGA
ACGGGGGGTTTCGTGCACACAGCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATAC
CTACAGCGTGAGCATTGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTAT
CCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCC
TGGTATCTTTATAGTCCTGTGCGGTTTTGCCACCTCTGACTTGAGCGTCGATTTTTGTGA
TGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTC
CTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTG
GATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAG
CGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCC
GCGCGTTGGCCGATTCATTAATGCAGAGCTTGCAATTCGCGCGTTTTTCAATATTATTGA
AGCATTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAAT
AAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCTAAGAAACC
ATTATTATCATGACATTAACCTATAAAAATAGGCGTAGTACGAGGCCCTTTCACTCATTAG

FIG.90D

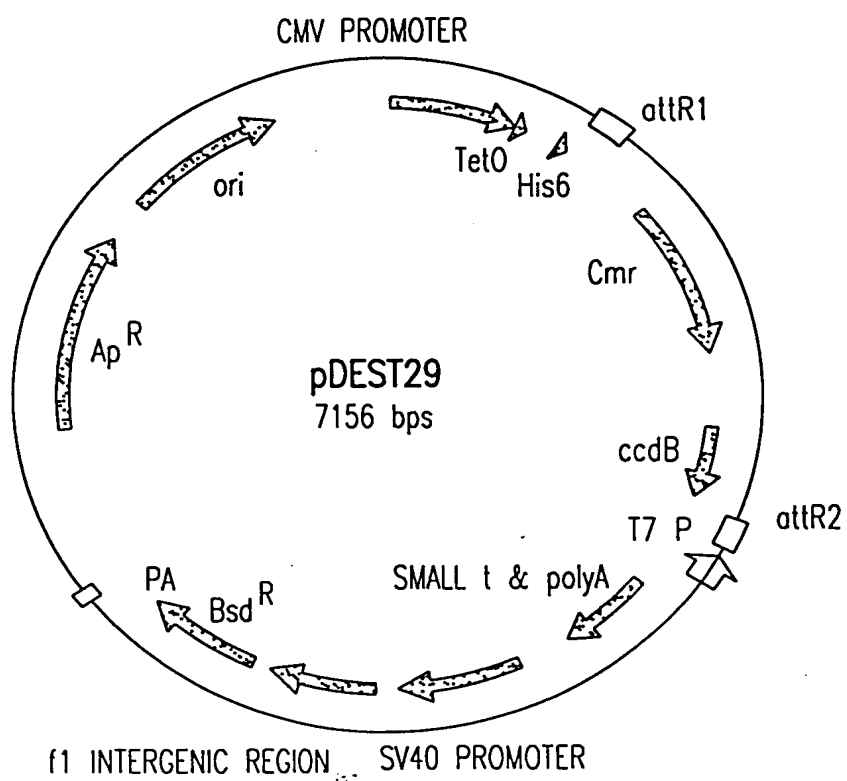


FIG.91A

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pDEST29 7156 bp

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCC
CGCCCATTTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGAC
TCACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTGGCACCAA
AATCAACGGGACTTTCCAAAATGTCGTAACAACCTCCGCCCCATTGACGCAAATGGGCGGT
AGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACC
ATGGCGTACTACCATCACCATCACCATCACACCGGTGATATCCTCGAGCCCATCACAAGT
TTGTACAAAAAAGCTGAACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAG
ATTTTGCATAAAAAACAGACTACATAACTGTAAAACACAACATATCCAGTCACTATGG
CGGCCGCATTAGGCACCCAGGCTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGGA
TTTTGAGTTAGGATCCGGCGAGATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAAA
TCACTGGATATACCACCGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGAGGCAT
TTCAGTCAGTTGCTCAATGTACCTATAACCAGACCGTTCAGCTGGATATTACGGCCTTTT
TAAAGACCGTAAAGAAAAATAAGCACAAGTTTTATCCGGCCTTTATTCACATTCTTGCCC
GCCTGATGAATGCTCATCCGGAATCCGTATGGCAATGAAAGACGGTGAGCTGGTGATAT
GGGATAGTGTTACCCCTTGTTACACCGTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGC
TCTGGAGTGAATACCACGACGATTTCCGGCAGTTTCTACACATATATTGCAAGATGTGG
CGTGTTACGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTATTGAGAATATGTTTTTCG
TCTCAGCCAATCCCTGGGTGAGTTTACCAGTTTTGATTTAAACGTGGCCAATATGGACA
ACTTCTTCGCCCCCGTTTTACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGA
TGCCGCTGGCGATTACAGGTTTCATCATGCCGTCTGTGATGGCTTCCATGTCCGCAGAATGC
TTAATGAATTACAACAGTACTGCGATGAGTGGCAGGGCGGGGCGTAAACGCGTGGATCCG
GCTTACTAAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAA
TATATACTGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTAT
TACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATC
TCCGGTCTGGTAAGCACAACCATGCAGAATGAAGCCCGTCGTCTGCGTGCCGAACGCTGG
AAAGCGGAAAAATCAGGAAGGGATGGCTGAGGTCGCCCGGTTTATTGAAATGAACGGCTCT
TTTGCTGACGAGAACAGGGACTGGTGAAATGCAGTTTAAGGTTTACACCTATAAAAGAGA
GAGCCGTTATCGTCTGTTTGTGGATGTACAGAGTGATATTATTGACACGCCCGGGCGACG
GATGGTGATCCCCCTGGCCAGTGACGTCGTCTGTGTCAGATAAAGTCTCCCGTGAACTTTA
CCCGGTGGTGATATCGGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGT
GCCGGTCTCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAAATGACATCAA
AAACGCCATTAACCTGATGTTCTGGGGAATATAAATGTCAGGCTCCGTTATACACAGCCA

FIG.91B

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GTCTGCAGGTCGACCATAGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTT
TTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTCAG
CTTTCTTGTACAAAGTGGTGATGGGCGGCCGCTCTAGAGGGCCCAAGCTTACGCGTGCGAT
GCGACGTCATAGCTCTCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGT
TTTACAACGTCGTGACTGGGAAAACGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTT
CTGTGGTGTGACATAATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATAT
AAAATTTTTAAGTGTATAATGTGTTAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTT
GCTTACTGAGTATGATTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTG
TGTATTTTAGATTACAGTCCCAAGGCTCATTTACAGGCCCTCAGTCCTCACAGTCTGTT
CATGATCATAATCAGCCATACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTCCC
ACACCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTAT
TGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATT
TTTTTCACTGCATTCTAGTTGTGGTTTGTCCAACTCATCAATGTATCTTATCATGTCTG
GATCGATCCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTTGCGTATTGGCT
GGCGTAATAGCGAAGAGGCCCCGACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATG
GCGAATGGGACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCA
GCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCCT
TTCTCGCCACGTTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGT
TCCGATTTAGTGCTTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTCAC
GTAGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCT
TTAATAGTGGACTCTTGTTCCAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTT
TTGATTTATAAGGGATTTTGCCGATTTGGCCCTATTGGTTAAAAAATGAGCTGATTTAAC
AAATATTTAACGCGAATTTTAACAAAATATTAACGTTTACAATTTTCGCCTGATGCGGTAT
TTTCTCCTTACGCATCTGTGCGGTATTTACACCGCATACGCGGATCTGCGCAGCACCAT
GGCCTGAAATAACCTCTGAAAGAGGAACTTGGTTAGGTACCTTCTGAGGCGGAAAGAACC
AGCTGTGGAATGTGTGTCAGTTAGGGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAA
GTATGCAAAGCATGCATCTCAATTAGTCAGCAACCAGGTGTGGAAAGTCCCCAGGCTCCC
CAGCAGGCAGAAAGTATGCAAAGCATGCATCTCAATTAGTCAGCAACCATAGTCCCGCCCC
TAACTCCGCCCATCCCGCCCCTAACTCCGCCCAGTTCCGCCCATTCTCCGCCCCATGGCT
GACTAATTTTTTTTTATTTATGCAGAGGCCGAGGCCGCTCGGCCCTCTGAGCTATTCCAGA
AGTAGTGAGGAGGCTTTTTTGGAGGCCTAGGCTTTTGCAAAAAGCTTGATTCTTCTGACA
CAACAGTCTCGAACTTAAGACCATGGCCAAGCCTTTGTCTCAAGAAGAATCCACCCTCAT
TGAAAGAGCAACGGCTACAATCAACAGCATCCCCATCTCTGAAGACTACAGCGTCGCCAG
CGCAGCTCTCTCTAGCGACGGCCGCATCTTCACTGGTGTCAATGTATATCATTTTACTGG
GGGACCTTGTGCAGAACTCGTGGTGCTGGGCACTGCTGCTGCTGCGGCAGCTGGCAACCT
GACTTGTATCGTCGCGATCGGAAATGAGAACAGGGGCATCTTGAGCCCCTGCGGACGGTG
CCGACAGGTGCTTCTCGATCTGCATCCTGGGATCAAAGCCATAGTGAAGGACAGTGATGG
ACAGCCGACGGCAGTTGGGATTCTGTAATTGCTGCCCTCTGGTTATGTGTGGGAGGGCTA
AGCACTTCGTGGCCGAGTTCGAAATGACCGACCAAGCGACGCCCAACCTGCCATCACGAT
GGCCGCAATAAAATATCTTTATTTTCATTACATCTGTGTGTTGGTTTTTGTGTGAATCG
ATAGCGATAAGGATCCGCGTATGGTGCATCTCAGTACAATCTGCTCTGATGCCGCATAG

FIG.91C

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TTAAGCCAGCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTC
CCGGCATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTT
TCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAG
GTTAATGTCATGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTG
CGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGA
CAATAACCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACAT
TTCCGTGTGCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCA
GAAACGCTGGTGAAAGTAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATC
GAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCA
ATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGG
CAAGAGCAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTACCA
GTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATA
ACCATGAGTGATAAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAG
CTAACCGCTTTTTTGACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCG
GAGCTGAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCA
ACAACGTTGCGCAAACATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTA
ATAGACTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCT
GGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCA
GCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAG
GCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCAT
TGGTAACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTTCATTTT
TAATTTAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAA
CGTGAGTTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGA
GATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCG
GTGGTTTGTGTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTTCAGC
AGAGCGCAGATACCAAATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAG
AACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCC
AGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCG
CAGCGGTGCGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTAC
ACCGAACTGAGATACCTACAGCGTGAGCATTGAGAAAGCGCCACGCTTCCCGAAGGGAGA
AAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTT
CCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTGCGGTTTTCGCCACCTCTGACTTGAG
CGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAACGCCAGCAACGCG
GCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCGTTA
TCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGC
AGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGC
AAACCGCCTCTCCCCGCGCGTTGGCCGATTCAATTAATGCAGAGCTTGCAATTCGCGCGTT
TTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAA
TGTATTTAGAAAAATAACAAATAGGGGTTCGCGCACATTTCCCCGAAAAGTGCCACCT
GACGTCTAAGAAACCATTATTATCATGACATTAACCTATAAAAAATAGGCGTAGTACGAGG
CCCTTTCACTCATTAG

FIG.91D

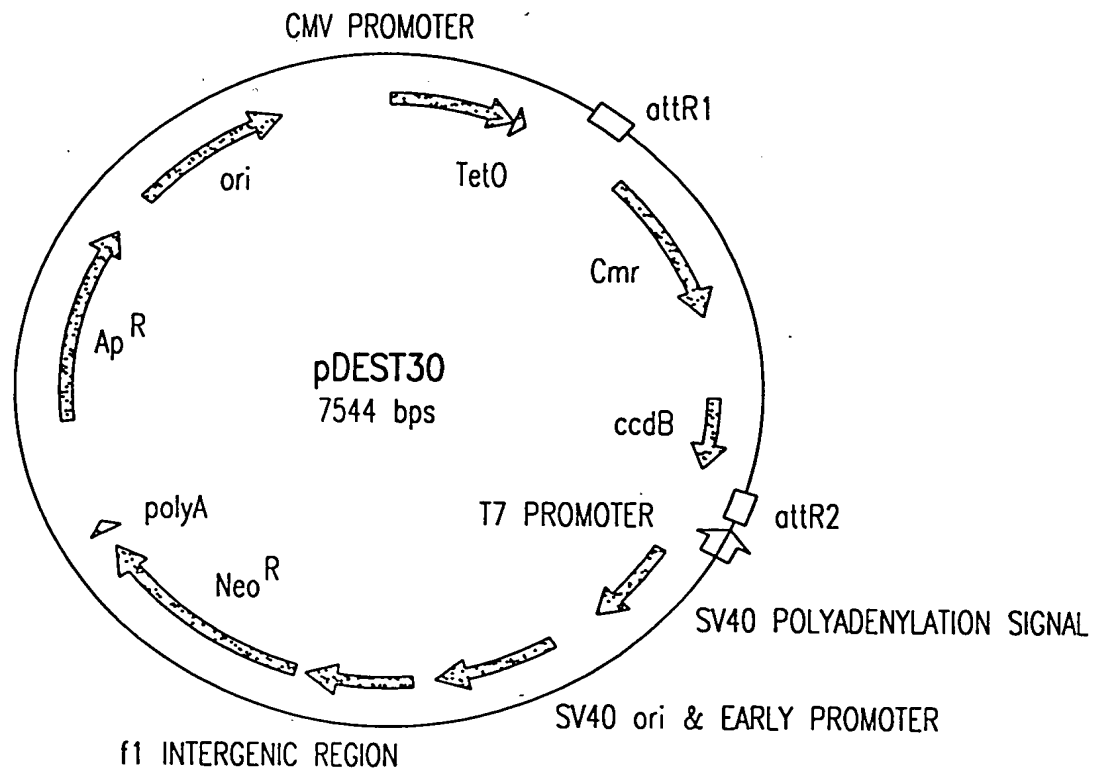


FIG.92A

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pDEST30 7544 bp

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCC
CGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGAC
TCACGGGGATTTCCAAGTCTCCACCCCAATTGACGTCAATGGGAGTTTTGTTTTGGCACCAA
AATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCAATTGACGCAAATGGGCGGT
AGGCGTGACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACT
CTAGAGGATCCCTACCGGTGATATCCTCGAGCCCATCAACAAGTTTGTACAAAAAAGCTG
AACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCATAAAAAAC
AGACTACATAATACTGTAAACACAACATATCCAGTCACTATGGCGGCCGCATTAGGCAC
CCCAGGCTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGGATTTTGTAGTTAGGATCC
GGCGAGATTTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACCAC
CGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGAGGCATTTTCAGTCAGTTGCTCA
ATGTACCTATAACCAGACCGTTTCAGCTGGATATTACGGCCTTTTTAAAGACCGTAAAGAA
AAATAAGCACAAGTTTTATCCGGCCTTTATTCACATTCTTGCCCGCCTGATGAATGCTCA
TCCGGAATTCCGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTACCCC
TTGTTACACCGTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGCTCTGGAGTGAATACCA
CGACGATTTCCGGCAGTTTCTACACATATATTGCGCAAGATGTGGCGTGTTACGGTGAAAA
CCTGGCCTATTTCCCTAAAGGGTTTTATTGAGAATATGTTTTTCGTCTCAGCCAATCCCTG
GGTGAGTTTTCACCAAGTTTTGATTTAAACGTGGCCAATATGGACAACCTTCTCGCCCCCGT
TTTCACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTCA
GGTTCATCATGCCGTCTGTGATGGCTTCCATGTGCGGCAGAATGCTTAATGAATTACAACA
GTACTGCGATGAGTGGCAGGGCGGGCGTAAAGATCTGGATCCGGCTTACTAAAAGCCAG
ATAACAGTATGCGTATTTGCGCGCTGATTTTTCGGGTATAAGAATATATACTGATATGTA
TACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGAC
AGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCA
CAACCATGCAGAATGAAGCCCGTCGTCTGCGTGCCGAACGCTGGAAAGCGGAAAATCAGG
AAGGGATGGCTGAGGTGCGCCCGTTTTATTGAAATGAACGGCTCTTTTGCTGACGAGAACA
GGGACTGGTGAAATGCAGTTTAAGGTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTG
TTTGTGGATGTACAGAGTGATATTATTGACACGCCCGGGCGACGGATGGTGATCCCCCTG
GCCAGTGACAGTCTGCTGTGTCAGATAAAGTCTCCCGTGAACCTTTACCCGGTGGTGATATC
GGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGGTCTCCGTTATC
GGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACTG
ATGTTCTGGGGAATATAAATGTCAGGCTCCCTTATACACAGCCAGTCTGCAGGTGACCA
TAGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTATGCAAAATCTA
ATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTTCAGCTTTCTTGACAAAGT
GGTTGATGGGCGGCCGCTCTAGAGGGCCCAAGCTTACGCGTGCATGCGACGTCATAGCTC
TCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGTTTTACAACGTCGTGA
CTGGGAAAACCTGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTTCTGTGGTGTGACATA

FIG.92B

ATTGGACAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATATAAAATTTTTAAGTGT
 ATAATGTGTTAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTTGCTTACTGAGTATGA
 TTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTGTGTATTTTAGATTCA
 CAGTCCCAAGGCTCATTTACAGGCCCTCAGTCCTCACAGTCTGTTTCATGATCATAATCAG
 CCATACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTCCACACCTCCCCCTGAA
 CCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTATTGCAGCTTATAATGG
 TTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTCACTGCATTCT
 TAGTTGTGGTTTGTCCAACTCATCAATGTATCTTATCATGTCTGGATCGATCCTGCATT
 AATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCCTATTGGCTGGCGTAATAGCGAAG
 AGGCCCCGACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGGACGCGC
 CCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACAC
 TTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCCTTCCCTTCTTCTCGCCACGTTTCG
 CCGGCTTTCCTCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTT
 TACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGGCCATCGC
 CCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCT
 TGTTCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTATAAGGGA
 TTTTGCCGATTTTCGGCCTATTGGTTAAAAATGAGCTGATTTAACAAATATTTAACGCGA
 ATTTTAACAAAATATTAACGTTTACAATTTTCGCTGATGCGGTATTTTCTCCTTACGCAT
 CTGTGCGGTATTTACACCGCATACGCGGATCTGCGCAGCACCATGGCCTGAAATAACCT
 CTGAAAGAGGAACTTGGTTAGGTACCTTCTGAGGCGGAAAGAACCAGCTGTGGAATGTGT
 GTCAGTTAGGGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAAGTATGCAAAGCATGC
 ATCTCAATTAGTCAGCAACCAGGTGTGGAAAGTCCCCAGGCTCCCCAGCAGGCAGAAGTA
 TGCAAAGCATGCATCTCAATTAGTCAGCAACCATAGTCCCGCCCCCTAACTCCGCCCATCC
 CGCCCCCTAACTCCGCCAGTTCCGCCATTCTCCGCCCATGGCTGACTAATTTTTTTTA
 TTTATGCAGAGGCCGAGGCCGCTCGGCCTCTGAGCTATTCCAGAAGTAGTGAGGAGGCT
 TTTTTGGAGGCCCTAGGCTTTTGCAAAAAGCTTGATTCTTCTGACACAACAGTCTCGAACT
 TAAGGCTAGAGCCACCATGATTGAACAAGATGGATTGCACGCAGGTTCTCCGGCCGCTTG
 GGTGGAGAGGCTATTTCGGCTATGACTGGGCACAACAGACAATCGGCTGCTCTGATGCCGC
 CGTGTTCCGGCTGTCAGCGCAGGGGCGCCGGTTCTTTTTGTCAAGACCGACCTGTCCGG
 TGCCCTGAATGAACTGCAGGACGAGGCGAGCGCGGCTATCGTGGCTGGCCACGACGGGCGT
 TCCTTGCGCAGCTGTGCTCGACGTTGTCACTGAAGCGGGAAGGGACTGGCTGCTATTGGG
 CGAAGTGCCGGGGCAGGATCTCCTGTCATCTCACCTTGCTCCTGCCGAGAAAGTATCCAT
 CATGGCTGATGCAATGCGGCGGCTGCATACGTTGATCCGGCTACCTGCCATTTCGACCA
 CCAAGCGAAACATCGCATCGAGCGAGCACGTACTCGGATGGAAGCCGGTCTTGTCGATCA
 GGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAAGTGTTCGCCAGGCTCAA
 GGCGCGCATGCCCGACGGCGAGGATCTCGTCTGACCCATGGCGATGCCTGCTTGCCGAA
 TATCATGGTGGAAAATGGCCGCTTTTCTGGATTTCATCGACTGTGGCCGGCTGGGTGTGGC
 GGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGCGA
 ATGGGCTGACCGCTTCTCGTGCTTTACGGTATCGCCGCTCCCGATTTCGACGCGCATCGC
 CTTCTATCGCCTTCTTGACGAGTTCTTCTGAGCGGGACTCTGGGGTTTCGAAATGACCGAC
 CAAGCGACGCCAACCTGCCATCACGATGGCCGCAATAAAATATCTTTATTTTATTACA
 TCTGTGTGTTGGTTTTTGTGTGAATCGATAGCGATAAGGATCCGCGTATGGTGCATCT
 CAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCGCCAACACCCGC
 TGACGCGCCCTGACGGGCTTGTCTGCTCCCGCATCCGCTTACAGACAAGCTGTGACCGT
 CTCCGGGAGCTGCATGTGTGAGAGTTTTACCGTTCATCACCGAAACGCGCGAGACGAAA
 GGGCCTCGTGATACGCCTATTTTTATAGGTAAATGTCATGATAATAATGGTTTCTTAGAC

FIG.92C

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GTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAAT
ACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATATTG
AAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCGCCCTTATTCCCTTTTTTGCGGC
ATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGA
TCAGTTGGGTGCACGAGTGGGTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGA
GAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGG
CGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTGCGCGCATACACTATTC
TCAGAATGACTTGGTTGAGTACTACCAGTCACAGAAAAGCATCTTACGGATGGCATGAC
AGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACT
TCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTGACAAACATGGGGGATCA
TGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCG
TGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACCTATTAACGGCGAACT
ACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGG
ACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGG
TGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTAT
CGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGC
TGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCATATAT
ACTTTAGATTGATTTAAACCTTCATTTTTAATTTAAAGGATCTAGGTGAAGATCCTTTT
TGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCC
CGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGCTT
GCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTGTTGCCGGATCAAGAGCTACCAAC
TCTTTTTCCGAAGGTAACGGCTTCAGCAGAGCGCAGATACCAAATACTGTCTTCTAGT
GTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCTCT
GCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGA
CTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGCTGAACGGGGGGTTCGTGCAC
ACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGTACCTACAGCGTGAGCATTG
AGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGT
CGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCC
TGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCG
GAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCC
TTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACCGC
CTTTGAGTGAGCTGATACCGCTCGCCGACCGGAACGACCGAGCGCAGCGAGTCAGTGAG
CGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGGTTGGCCGATTCA
TTAATGCAGAGCTTGCAATTCGCGCGTTTTTCAATATTATTGAAGCATTTATCAGGGTTA
TTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAATAGGGGTTCC
GCGCACATTTCCCCGAAAAGTGCCACCTGACGTCTAAGAAACCATTATTATCATGACATT
AACCTATAAAAATAGGCGTAGTACGAGGCCCTTCACTCATTAG

FIG.92D

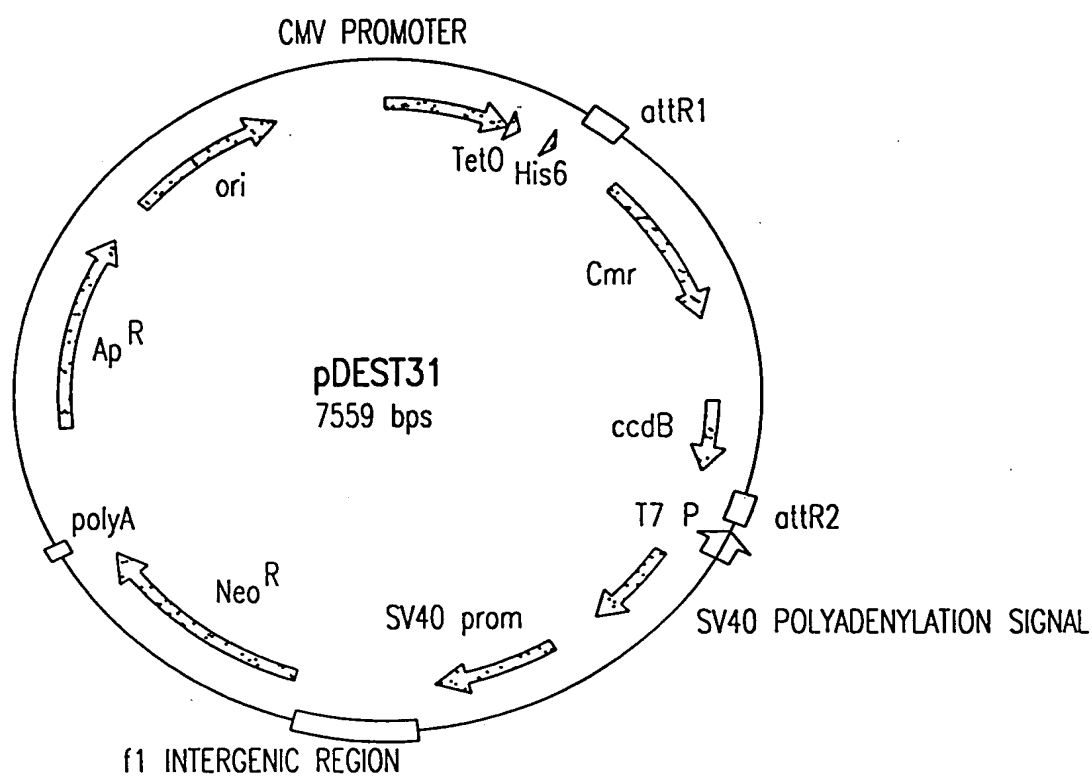


FIG.93A

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pDEST31 7559 bp

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCC
CGCCCATTTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGAC
TCACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTTTTGGCACCAA
AATCAACGGGACTTTCCAAAATGTCGTAACAACCTCCGCCCATTTGACGCAAATGGGCGGT
AGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACC
ATGGCGTACTACCATCACCATCACCATCACACCGGTGATATCCTCGAGCCCATCACAAAGT
TTGTACAAAAAAGCTGAACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAG
ATTTTGCATAAAAAACAGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGG
CGGCCGCATTAGGCACCCCAGGCTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGGA
TTTTGAGTTAGGATCCGGCGAGATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAAA
TCACTGGATATACCACCGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGAGGCAT
TTCAGTCAGTTGCTCAATGTACCTATAACCAGACCGTTCAGCTGGATATTACGGCCTTTT
TAAAGACCGTAAAGAAAAATAAGCACAAAGTTTTATCCGGCCTTTATTACATTCTTGCCC
GCCTGATGAATGCTCATCCGGAATTCCGTATGGCAATGAAAGACGGTGAGCTGGTGATAT
GGGATAGTGTTACCCCTTGTTACACCGTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGC
TCTGGAGTGAATACCACGACGATTTCCGGCAGTTTCTACACATATATTGCAAGATGTGG
CGTGTTACGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTATTGAGAATATGTTTTTCG
TCTCAGCCAATCCCTGGGTGAGTTTACCAGTTTTGATTTAAACGTGGCCAATATGGACA
ACTTCTTCGCCCCCGTTTTACCATGGGCAAAATATTATACGCAAGGCGACAAGGTGCTGA
TGCCGCTGGCGATTGAGTTTCATCATGCCGTCTGTGATGGCTTCCATGTGCGGCAGAATGC
TTAATGAATTACAACAGTACTGCGATGAGTGGCAGGGCGGGGCGTAAACGCGTGGATCCG
GCTTACTAAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAA
TATACTGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTAT
TACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATC
TCCGGTCTGGTAAGCACAAACCATGCAGAATGAAGCCCGTCTGCTGCGTGCCGAACGCTGG
AAAGCGGAAAATCAGGAAGGGATGGCTGAGGTGCGCCGTTTTATTGAAATGAACGGCTCT
TTTGCTGACGAGAACAGGGACTGGTGAAATGCAGTTTAAGGTTTACACCTATAAAAGAGA
GAGCCGTTATCGTCTGTTTGTGGATGTACAGAGTGATATTATTGACACGCCCGGGCGACG
GATGGTGATCCCCCTGGCCAGTGACGTCTGCTGTGATGATAAAGTCTCCCGTGAACTTTA
CCCGGTGGTGATATCGGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGT
GCCGGTCTCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAA
AAACGCCATTAACTGATGTTCTGGGGAATATAAATGTCAGGCTCCGTTATACACAGCCA
GTCTGCAGGTCGACCATAGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTT
TTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTTCA
CTTTCTTGTAAGTGGTGATGGGCGGCCGCTCTAGAGGGCCCAAGCTTACGCGTGAT
GCGACGTCATAGCTCTCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGT
TTTACAACGTCGTGACTGGGAAAACCTGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTT

FIG.93B

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CTGTGGTGTGACATAATTGGACAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATAT
AAAATTTTAAAGTGTATAATGTGTTAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTT
GCTTACTGAGTATGATTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTG
TGTATTTTAGATTCACAGTCCCAAGGCTCATTTCAGGCCCTCAGTCCTCACAGTCTGTT
CATGATCATAATCAGCCATACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTCCC
ACACCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTAT
TGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATT
TTTTTCACTGCATTCTAGTTGTGGTTTGCCAACTCATCAATGTATCTTATCATGTCTG
GATCGATCCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGCGTATTGGCT
GGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATG
GCGAATGGGACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCA
GCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTCTTCCCTTCCCT
TTCTCGCCACGTTTCGCCGGCTTTCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGT
TCCGATTTAGTGCTTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTCAC
GTAGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCT
TTAATAGTGGACTCTTGTTCCAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTT
TTGATTTATAAGGGATTTTGCCGATTTCCGGCTATTGGTTAAAAAATGAGCTGATTTAAC
AAATATTTAACGCGAATTTTAAACAAATATTAACGTTTACAATTTGCGCTGATGCGGTAT
TTTCTCCTTACGCATCTGTGCGGTATTTACACCCGCATACGCGGATCTGCGCAGCACCAT
GGCCTGAAATAACCTCTGAAAGAGGAACTTGTTAGGTACCTTCTGAGGCGGAAAGAACC
AGCTGTGGAATGTGTGTCAGTTAGGGTGTGGAAAGTCCCAGGCTCCCAGCAGGCAGAA
GTATGCAAAGCATGCATCTCAATTAGTCAGCAACCAGGTGTGGAAAGTCCCAGGCTCCC
CAGCAGGCAGAAGTATGCAAAGCATGCATCTCAATTAGTCAGCAACCATAGTCCCGCCCC
TAACTCCGCCCATCCCGCCCCTAACCTCCGCCCAGTTCCGCCCATCTCCGCCCATGGCT
GACTAATTTTTTTTTATTTATGCAGAGGCCGAGGCCGCTCGGCCTCTGAGCTATTCCAGA
AGTAGTGAGGAGGCTTTTTTGGAGGCCTAGGCTTTTGCAAAAAGCTTGATTCTTCTGACA
CAACAGTCTCGAACTTAAGGCTAGAGCCACCATGATTGAACAAGATGGATTGCACGCAGG
TTCTCCGGCCGCTTGGGTGGAGAGGCTATTCCGGCTATGACTGGGCACAACAGACAATCGG
CTGCTCTGATGCCGCCGTGTTCCGGCTGTGAGCGCAGGGGCGCCCGGTTCTTTTTGTCAA
GACCGACCTGTCCGGTGCCCTGAATGAACTGCAGGACGAGGCAGCGCGGCTATCGTGGCT
GGCCACGACGGGCGTTCTTGCGCAGCTGTGCTCGACGTTGTCACTGAAGCGGGAAGGGA
CTGGCTGCTATTGGGCGAAGTGCCGGGGCAGGATCTCCTGTCATCTCACCTTGCTCCTGC
CGAGAAAGTATCCATCATGGCTGATGCAATGCGGCGGCTGCATACGCTTGATCCGGCTAC
CTGCCCATTGACCACCAAGCGAAACATCGCATCGAGCGAGCACGTAAGCGGATGGAAGC
CGGTCTTGTCGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAAC
GTTCCGCCAGGCTCAAGGCGCGCATGCCCGACGGCGAGGATCTCGTCTGACCCATGGCGA
TGCCTGCTTGCCGAATATCATGGTGGAAAATGGCCGTTTTCTGGATTCATCGACTGTGG
CCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGA
AGAGCTTGGCGGCGAATGGGCTGACCGCTTCTCTGCTGTTTACGGTATCGCCGCTCCCGA
TTCGACGCGCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGCGGGACTCTGGGG
TTCGAAATGACCGACCAAGCGACGCCAACCTGCCATCACGATGGCCGCAATAAAATATC
TTTATTTTCATTACATCTGTGTGTTGGTTTTTGTGTGAATCGATAGCGATAAGGATCCG
CGTATGGTGAATCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACA
CCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAG
ACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGGTTTTACCGTCTACCCGAA
ACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAAT

FIG.93C

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AATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTG
TTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAAT
GCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCGCCCTTAT
TCCCTTTTTTGCGGCATTTTGCCCTTCTGTTTTTGCTCACCCAGAAACGCTGGTGAAAGT
AAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTCAACAG
CGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAA
AGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTGCG
CCGCATACACTATTCTCAGAATGACTTGTTGAGTACTCACCAGTCACAGAAAAGCATCT
TACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAACAC
TGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTGCA
CAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCAT
ACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC
ATTAACGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGC
GGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGA
TAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGG
TAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACG
AAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACGTGTCAGACCA
AGTTTACTCATATATACTTTAGATTGATTTAAACTTTCATTTTTAATTTAAAGGATCTA
GGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCA
CTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCG
CGTAATCTGCTGCTTGCAAACAAAAAACACCGCTACCAGCGGTGGTTTGTGGCGGA
TCAAGAGCTACCAACTCTTTTTCCGAAGGTAACGGCTTCAGCAGAGCGCAGATACCAA
TACTGTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCC
TACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTG
TCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGCTGAAC
GGGGGGTTCTGTGCACACAGCCAGCTTGAGCGAACGACCTACACCGAACTGAGATACCT
ACAGCGTGAGCATTGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCC
GGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGAAACGCCTG
GTATCTTTATAGTCCTGTGCGGTTTTGCCACCTCTGACTTGAGCGTCGATTTTTGTGATG
CTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCT
GGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTCTGCGTTATCCCCTGATTCTGTGGA
TAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGCG
CAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGC
GCGTTGGCCGATTCATTAATGCAGAGCTTGCAATTCGCGCGTTTTTCAATATTATTGAAG
CATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAA
ACAAATAGGGGTTCCGCGCACATTTCCCGAAAAGTGCCACCTGACGTCTAAGAAACCAT
TATTATCATGACATTAACCTATAAAAATAGGCGTAGTACGAGGCCCTTCACTCATTAG

FIG.93D

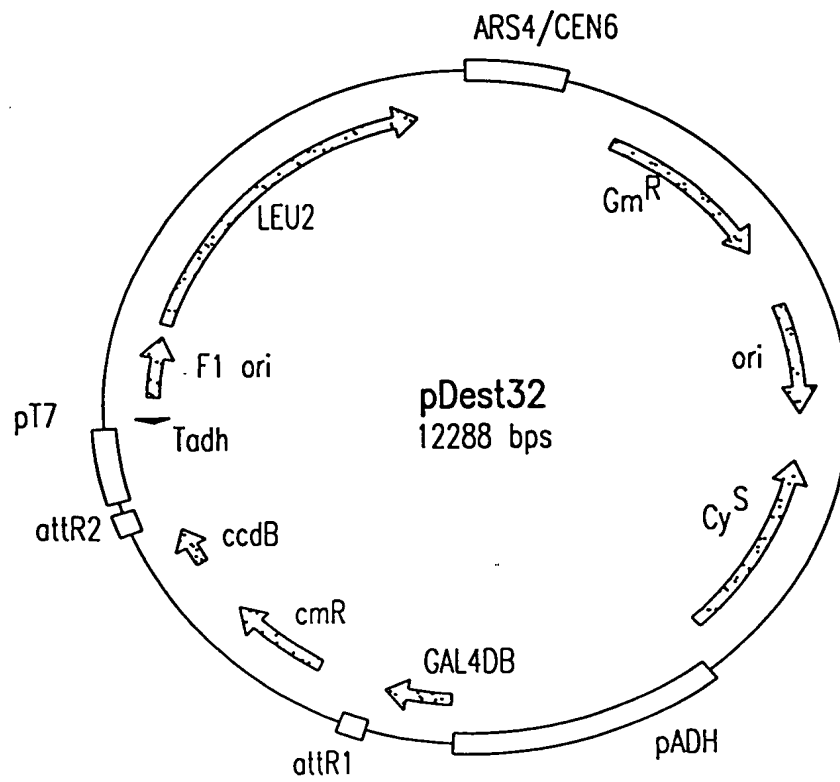


FIG.94A

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GACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTT
CTTAGGACGGATCGCTTGCCTGTAACCTACACGCGCCTCGTATCTTTTAATGATGGAATA
ATTTGGGAATTTACTCTGTGTTTATTTATTTTTATGTTTTGTATTTGGATTTTAGAAAGT
AAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAAATAAACAAAGGTTTAAAAA
ATTTCAACAAAAAGCGTACTTTACATATATATTTATTAGACAAGAAAAGCAGATTAAATA
GATATACATTTCGATTAACGATAAGTAAAATGTAAAATCACAGGATTTTCGTGTGTGGTCT
TCTACACAGACAAGATGAAACAATTCGGCATTAACTGAGAGCAGGAAGAGCAAGATA
AAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTACATCTTCGGAAAACAAAACT
ATTTTTTCTTTAATTTCTTTTTTACTTTCTATTTTTAATTTATATATTTATATTAATAA
ATTTAAATTATAATTATTTTTATAGCACGTGATGAAAAGGACCCAGGTGGCAGTTTTCGG
GGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCG
CTCATGAGACAATAACCCTGATAAATGCTTCAATAATCTGCAGTGCGCAGGGCCCGTGTC
TCAAAATCTCTGATGTTACATTGCACAAGATAAAAATATATCATCATGAACAATAAACT
GTCTGCTTACATAAACAGTAATACAAGGGGTGTTATGAGCCATATTCAACGGGAAACGTC
TTGCTGGAGGCCGCGATTAAATTCCAACATGGATGCTGATTTATATGGGTATAAATGGGC
TCGGTAGCCAACCACTAGAACTATAGCTAGAGTCTGGGCGAACAACGATGCTCGCCTT
CCAGAAAACCGAGGATGCGAACCACTTCATCCGGGGTCAGCACCACCGGCAAGCGCCGCG
ACGGCCGAGGTCTTCCGATCTCCTGAAGCCAGGGCAGATCCGTGCACAGCACCTTGCCGT
AGAAGAACAGCAAGGCCGCAATGCCTGACGATGCGTGGAGACCGAAACCTTGCGCTCGT
TCGCCAGCCAGGACAGAAATGCCTCGACTTCGCTGCTGCCCAAGGTTGCCGGGTGACGCA
CACCGTGGAACGGATGAAGGCACGAACCCAGTTGACATAAGCCTGTTTCGGTTCGTAAAC
TGTAATGCAAGTAGCGTATGCGCTCACGCAACTGGTCCAGAACCCTTGACCGAACGCAGCG
GTGGTAACGGCGCAGTGGCGGTTTTTCATGGCTTGTTATGACTGTTTTTTGTACAGTCTA
TGCCTCGGGCATCCAAGCAGCAAGCGGTTACGCCGTGGGTGATGTTTGATGTTATGGA
GCAGCAACGATGTTACGCAGCAGCAACGATGTTACGCAGCAGGGCAGTCGCCCTAAACA
AAGTTAGGTGGCTCAAGTATGGGCATCATTCGCACATGTAGGCTCGGCCCTGACCAAGTC
AAATCCATGCGGGCTGCTCTTGATCTTTTCGGTCGTGAGTTTCGGAGACGTAGCCACCTAC
TCCCAACATCAGCCGGAATCCGATTACCTCGGGAACCTTGCTCCGTAGTAAGACATTCATC
GCGCTTGCTGCCCTTCGACCAAGAAGCGGTTGTTGGCGCTCTCGCGGCTTACGTTCTGCC
AGGTTTGAGCAGCCGCGTAGTGAGATCTATATCTATGATCTCGCAGTCTCCGGCGAGCAC
CGGAGGCAGGGCATTGCCACCGCGCTCATCAATCTCCTCAAGCATGAGGCCAACGCGCTT
GGTGCTTATGTGATCTACGTGCAAGCAGATTACGGTGACGATCCCGCAGTGGCTCTCTAT
ACAAAGTTGGGCATACGGGAAGAAGTGATGCACTTTGATATCGACCCAAGTACCGCCACC
TAACAATTCGTTCAAGCCGAGATCGGCTTCCCGGCCTAATAGGTTGTATTGATGTTGGAC
GAGTCGGAATCGCAGACCGATACCAGGATCTTGCCATCCTATGGAACCTGCCTCGGTGAGT
TTTCTCCTTCATTACAGAAACGGCTTTTTCAAAAATATGGTATTGATAATCCTGATATGA
ATAAATTGCAGTTTCATTTGATGCTCGATGAGTTTTTCTAATCAGAATTGGTTAATTGGT
TGTAACACTGGCAGAGCATTACGCTGACTTGACGGGACGGCGNCATGACCAAAATCCCTT
AACGTGAGTTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTT
GAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACACCGCTACCAG

FIG.94B

CGGTGGTTTGTGGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTTCA
 GCAGAGCGCAGATACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCA
 AGAACTCTGTAGCACC GCCTACATACCTCGCTCTGCTAATCCTGTTACCAAGTGGCTGCTG
 CCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGG
 CGCAGCGGTGCGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCT
 ACACCGAACTGAGATACCTACAGCGTGAGCATTGAGAAAGCGCCACGCTTCCCGAAGGGA
 GAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGGAGC
 TTCCAGGGGGGAACGCCTGGTATCTTATAGTCCTGTGCGGTTTCGCCACCTCTGACTTG
 AGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACG
 CGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTCTGCGT
 TATCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCC
 GCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATAC
 GCAAACCGCCTCTCCCCGCGGTTGGCCGATTCATTAATGCAGCTGGCACGACAGGTTTC
 CCGACTGGAAAGCGGGCAGTGAGCGCAACGCAATTAATGTGAGTTACCTCACTCATTAGG
 CACCCCAGGCTTTACACTTTATGCTTCCGGCTCCTATGTTGTGTGGAATTGTGAGCGGAT
 AACAAATTCACACAGGAAACAGCTATGACCATGATTACGCCAAGCTCGGAATTAACCTC
 ACTAAAGGGAACAAAAGCTGGTACCGATCCCGAGCTTTGCAAATTAAGCCTTCGAGCGT
 CCCAAAACCTTCTCAAGCAAGGTTTTAGTATAATGTTACATGCGTACACGCGTCTGTAC
 AGAAAAAAGAAAAATTTGAAATATAATAACGTTCTTAATACTAACATAACTATAAAA
 AAATAAATAGGGACCTAGACTTCAGGTTGTCTAACTCCTTCTTTTCGGTTAGAGCGGAT
 GTGGGGGGAGGGCGTGAATGTAAGCGTGACATAACTAATTACATGATATCGACAAAGGAA
 AAGGGGCCTGTTTACTCACAGGCTTTTTCAAGTAGGTAATTAAGTCGTTTCTGTCTTTT
 TCCTTCTTCAACCCACCAAAGGCCATCTTGGTACTTTTTTTTTTTTTTTTTTTTTTTTTT
 TT
 TTTTTTTTCATAGAAATAATACAGAAGTAGATGTTGAATTAGATTAACTGAAGATATAT
 AATTTATTGGAAAATACATAGAGCTTTTTGTTGATGCGCTTAAGCGATCAATTCAACAAC
 ACCACCAGCAGCTCTGATTTTTCTTCAGCCAACCTTGGAGACGAATCTAGCTTTGACGAT
 AACTGGAACATTTGGAATTCTACCTTACCCAAGATCTTACCGTAACCGGCTGCCAAAGT
 GTCAATAACTGGAGCAGTTTCCTTAGAAGCAGATTTCAAGTATTGGTCTCTCTGTCTTC
 TGGGATCAATGTCCACAATTTGTCCAAGTTCAAGACTGGCTTCCAGAAATGAGCTTGTTG
 CTTGTGGAAGTATCTCATACCAACCTTACCGAAATAACCTGGATGGTATTTATCCATGTT
 AATTCTGTGGTGATGTTGACCACCGGCCATACCTCTACCACCGGGGTGCTTCTGTGCTT
 ACCGATACGACCTTTACCGGCTGAGACGTGACCTCTGTGCTTCTAGTCTTAGTGAATCT
 GGAAGGCATTCTTGATTAGTTGGATGATTGTTCTGGGATTTAATGCAAAAATCACTTAAG
 AAGGAAAATCAACGGAGAAAGCAAACGCCATCTTAAATATACGGGATACAGATGAAAGGG
 TTTGAACCTATCTGGAAAATAGCATTAAACAAGCGAAAAACTGCGAGGAAAATTGTTTGC
 GTCTCTGCGGGCTATTACGCGCCAGAGGAAAATAGGAAAAATAACAGGGCATTAGAAAA
 ATAATTTTGATTTTGGTAATGTGTGGGTCTGGTGTACAGATGTTACATTGGTTACAGTA
 CTCTTGTTTTGCTGTGTTTTCGATGAATCTCCAAAATGGTTGTTAGCACATGGAAGAG
 TCACCGATGCTAAGTTATCTCTATGTAAGCTACGTGGCGTGACTTTTGATGAAGCCGCAC
 AAGAGATACAGGATTGGCAACTGCAAATAGAATCTGGGGATCCCCCTCGAGATCCGGGA
 TCGAAGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATGAAGGCAAAAGACAAATA
 TAAGGGTCGAACGAAAAATAAAGTGAAAAGTGTTGATATGATGTATTTGGCTTTCGGCGC

FIG.94C

CCGAAAAAACGAGTTTACGCAATTGCACAATCATGCTGACTCTGTGGCGGACCCGCGCTC
 TTGCCGGCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCCGGCGGAGTTTTTTGCGCCTG
 CATTTTCCAAGGTTTACCCTGCGCTAAGGGGCGAGATTGGAGAAGCAATAAGAATGCCGG
 TTGGGGTTGCGATGATGACGACCACGACAACCTGGTGTCAATTATTTAAGTTGCCGAAAGAA
 CCTGAGTGCATTTGCAACATGAGTATACTAGAAGAATGAGCCAAGACTTGCGAGACGCGA
 GTTTGCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAGGTGAGACGCGCATAACC
 GCTAGAGTACTTTGAAGAGGAAACAGCAATAGGGTTGCTACCAGTATAAATAGACAGGTA
 CATAACAACCTGGAAATGGTTGTCTGTTTGAGTACGCTTTCAATTCATTTGGGTGTGCAC
 TTTATTATGTTACAATATGGAAGGGAACCTTTACACTTCTCCTATGCACATATATTAATTA
 AAGTCCAATGCTAGTAGAGAAGGGGGGTAACACCCCTCCGCGCTCTTTTCCGATTTTTTT
 CTAAACCGTGGAATATTTCCGATATCCTTTTGTTGTTTCCGGGTGTACAATATGGACTTC
 CTCTTTTCTGGCAACCAAACCCATACATCGGGATTCTCTATAATACCTTCGTTGGTCTCCC
 TAACATGTAGGTGGCGGAGGGGAGATATAACAATAGAACAGATACCAGACAAGACATAATG
 GGCTAAACAAGACTACACCAATTACACTGCCTCATTGATGGTGGTACATAACGAACATAAT
 ACTGTAGCCCTAGACTTGATAGCCATCATCATATCGAAGTTTCACTACCCTTTTTCCATT
 TGCCATCTATTGAAGTAATAATAGGCGCATGCAACTTCTTTTCTTTTTTTTTCTTTTCTC
 TCTCCCCCGTTGTTGTCTCACCATATCCGCAATGACAAAAAAATGATGGAAGACACTAA
 AGGAAAAAATTAACGACAAAGACAGCACCAACAGATGTCGTTGTTCCAGAGCTGATGAGG
 GGTATCTTCGAACACACGAAACTTTTTCTTCTTCATTACGCACACTACTCTCTAATG
 AGCAACGGTATACGGCCTTCTTCCAGTTACTTGAATTTGAAATAAAAAAAGTTTGCCGC
 TTTGCTATCAAGTATAAATAGACCTGCAATTATTAATCTTTTGTTTCTCGTCATTGTTCT
 TCGTTCCCTTTCTTCTTGTCTTTTTCTTGCACAATATTTCAAGCTATACCAAGCATAAC
 AATCAACTCCAAGCTTGAAGCAAGCCTCCTGAAAGATGAAGCTACTGTCTTCTATCGAAC
 AAGCATGCGATATTTGCCGACTTAAAAGCTCAAGTGCTCCAAAGAAAAACCGAAGTGCG
 CCAAGTGTCTGAAGAACAACCTGGGAGTGTGCTACTCTCCCAAACCAAAGGTCTCCGC
 TGACTAGGGCACATCTGACAGAAGTGGAATCAAGGCTAGAAAGACTGGAACAGCTATTTCT
 TACTGATTTTTCTCGAGAAGACCTTGACATGATTTTGAAATGGATTCTTTACAGGATA
 TAAAAGCATTGTTAACAGGATTATTTGTACAAGATAATGTGAATAAAGATGCCGTCACAG
 ATAGATTGGCTTCAGTGGAGACTGATATGCCTCTAACATTGAGACAGCATAGAATAAGTG
 CGACATCATCATCGGAAGAGAGTAGTAACAAAGGTCAAAGACAGTTGACTGTATCGTCGA
 GGTGCAATCAAACAAGTTTGTACAAAAAGCTGAACGAGAAACGTAAAATGATATAAATA
 TCAATATATTAATTAGATTTTGCATAAAAAACAGACTACATAAATACTGTAAACACAAC
 ATATCCAGTCACTATGGCGGCCGCTAAGTTGGCAGCATCACCCGACGCACTTTGCGCCGA
 ATAAATACCTGTGACGGAAGATCACTTCGCAGAATAAATAAATCCTGGTGTCCCTGTTGA
 TACCGGGAAGCCCTGGGCCAACCTTTTGGCGAAAATGAGACGTTGATCGGCACGTAAGAGG
 TTCCAACCTTACCATAATGAAATAAGATCACTACCGGGCGTATTTTTTGAGTTATCGAG
 ATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACCACCGTTGA
 TATATCCCAATGGCATCGTAAAGAACATTTTGAGGCATTTCAAGTCAGTTGCTCAATGTAC
 CTATAACCAGACCGTTAGCTGGATATTACGGCCTTTTTAAAGACCGTAAAGAAAAATAA
 GCACAAGTTTTATCCGGCCTTTATTCACATTCTTGCCCGCCTGATGAATGCTCATCCGGA
 ATTCCGTATGGCAATGAAAGACGGTGAGCTGGTGTATATGGGATAGTGTTACCCCTTGTTA
 CACCGTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGCTCTGGAGTGAATACCACGACGA
 TTTCCGGCAGTTTCTACACATATATTCGCAAGATGTGGCGTGTTACGGTGAAAACCTGGC

FIG.94D

CTATTTCCCTAAAGGGTTTATTGAGAATATGTTTTTCGTCTCAGCCAATCCCTGGGTGAG
 TTTCACCAGTTTTGATTTAAACGTGGCCAATATGGACAACCTTCTTCGCCCCCGTTTTTCAC
 CATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTACAGGTTC
 TCATGCCGTCTGTGATGGCTTCCATGTCCGCAGAATGCTTAATGAATTACAACAGTACTG
 CGATGAGTGGCAGGGCGGGGCGTAATCTAGAGGATCCGGCTTACTAAAAGCCAGATAACA
 GTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAATATATACTGATATGTATACCCG
 AAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGACAGCGAC
 AGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCACAACCA
 TGCAGAATGAAGCCCGTCGTCTGCGTGCCGAACGCTGGAAAGCGGAAAATCAGGAAGGGA
 TGGCTGAGGTGCGCCGGTTTTATTGAAATGAACGGCTCTTTTTGCTGACGAGAACAGGGACT
 GGTGAAATGCAGTTTAAGGTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTGTTTGTG
 GATGTACAGAGTGATATTATTGACACGCCCGGGCGACGGATGGTGATCCCCCTGGCCAGT
 GCACGTCTGCTGTGAGATAAAGTCTCCCGTGAACCTTACCCGGTGGTGATATCGGGGAT
 GAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGGTCTCCGTTATCGGGGAA
 GAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTGATGTTT
 TGGGGAATATAAATGTCAGGCTCCCTTATACACAGCCAGTCTGCAGGTGACCATAGTGA
 CTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTAATTTAA
 TATATTGATATTTATATCATTTTACGTTTCTCGTTTCAGCTTTCTTGTACAAAGTGGTTTG
 ATGGCCGCTAAGTAAGTAAGACGTGAGCTCTAAGTAAGTAACGGCCGCCACCGCGGTGG
 AGCTTTGGACTTCTTCGCCAGAGGTTTGGTCAAGTCTCCAATCAAGGTTGTGCGGCTTGTC
 TACCTTGCCAGAAATTTACGAAAAGATGGAAAAGGGTCAAATCGTTGGTAGATACGTTGT
 TGACACTTCTAAATAAGCGAATTTCTTATGATTTATGATTTTTATTATTAAATAAGTTAT
 AAAAAAATAAGTGTATACAAATTTAAAGTGACTCTTAGGTTTTAAACGAAAATCTT
 GTTCTTGAGTAACTCTTTCCTGTAGGTGAGTTGCTTCTCAGGTATAGCATGAGGTGCG
 TCTTATTGACCACACCTCTACCGGCATGCCGAGCAAATGCCTGCAAATCGCTCCCCATTT
 CACCCAATTGTAGATATGCTAACTCCAGCAATGAGTTGATGAATCTCGGTGTGTATTTTA
 TGTCTCAGAGGACAATACCTGTTGTAATCGTTCTTCCACACGGATCCCAATTCGCCCTA
 TAGTGAGTCGTATTACAATTCAGTGGCGTCGTTTTACAACGTCGTGACTGGGAAAACCC
 TGGCGTTACCCAACCTAATCGCCTTGACGACATCCCCCTTTCGCCAGCTGGCGTAATAG
 CGAAGAGGCCCCGACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGAC
 GCGCCCTGTAGCGGCGCATTAAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCT
 ACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCTTCTCGCCACG
 TTCGCCGGCTTTCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGT
 GCTTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCA
 TCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGA
 CTCTTGTTCCAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAA
 GGGATTTTGCCGATTTGCGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAAC
 GCGAATTTTAACAAAAATTAACGTTTACAATTTCTGATGCGGTATTTTCTCCTTACGC
 ATCTGTGCGGTATTTACACCGCATATCGACCGGTGAGGAGAAGTCTTAGTATATCCAC
 ATACCTAATATTATTGCCTTATTAATAAATGGAATCGGAACAATTACATCAAAATCCACAT
 TCTCTTCAAAATCAATTGTCTGTACTTCTTGTTCATGTGTGTTCAAAAACGTTATATT
 TATAGGATAATTATACTCTATTTCTCAACAAGTAATTGGTTGTTTGGCCGAGCGGTCTAA
 GGCGCCTGATTCAAGAAATATCTTGACCGCAGTTAACTGTGGGAATACTCAGGTATCGTA

FIG.94E

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AGATGCAAGAGTTCGAATCTCTTAGCAACCATTATTTTTTCTCAACATAACGAGAACA
CACAGGGGCGCTATCGCACAGAATCAAATTCGATGACTGGAAATTTTTGTTAATTTTCAG
AGGTCGCCTGACGCATATACCTTTTTCAACTGAAAAATTGGGAGAAAAAGGAAAGGTGAG
AGGCCGGAACCGGCTTTTCATATAGAATAGAGAAGCGTTCATGACTAAATGCTTGCATCA
CAATACTTGAAGTTGACAATATTATTTAAGGACCTATTGTTTTTCCAATAGGTGGTTAG
CAATCGTCTTACTTTCTAACTTTTCTTACCTTTTACATTTTCAGCAATATATATATATATT
TCAAGGATATACCATTCTAATGTCTGCCCCTATGTCTGCCCCTAAGAAGATCGTCGTTTT
GCCAGGTGACCACGTTGGTCAAGAAATCACAGCCGAAGCCATTAAGGTTCTTAAAGCTAT
TTCTGATGTTTCGTTCCAATGTCAAGTTCGATTTTCGAAAATCATTTAATTGGTGGTGCTGC
TATCGATGCTACAGGTGTCCCACTTCCAGATGAGGCGCTGGAAGCCTCCAAGAAGGTTGA
TGCCGTTTTGTAGGTGCTGTGGGTGGTCCTAAATGGGGTACCGGTAGTGTTAGACCTGA
ACAAGGTTTACTAAAAATCCGTAAAGAACTTCAATTGTACGCCAACTTAAGACCATGTAA
CTTTGCATCCGACTCTCTTTTAGACTTATCTCCAATCAAGCCACAATTTGCTAAAGGTAC
TGACTTCGTTGTTGTCAGAGAATTAGTGGGAGGTATTTACTTTGGTAAGAGAAAGGAAGA
CGATGGTGATGGTGTGCTTGGGATAGTGAACAATACACCGTTCCAGAAGTGCAAAGAAT
CACAAGAATGGCCGCTTTCATGGCCCTACAACATGAGCCACCATTGCCTATTTGGTCCTT
GGATAAAGCTAATGTTTTGGCCTCTTCAAGATTATGGAGAAAACTGTGGAGGAAACCAT
CAAGAACGAATTCCTACATTGAAGGTTCAACATCAATTGATTGATTCTGCCGCCATGAT
CCTAGTTAAGAACCCAACCCACCTAAATGGTATTATAATCACCAGCAACATGTTTGGTGA
TATCATCTCCGATGAAGCCTCCGTTATCCCAGGTTCCCTTGGGTTTGTGCCATCTGCGTC
CTTGGCCTCTTTGCCAGACAAGAACCCGCATTTGGTTTGTACGAACCATGCCACGGTTC
TGCTCCAGATTTGCCAAAGAATAAGGTTGACCCTATCGCCACTATCTTGTCTGCTGCAAT
GATGTTGAAATTGTCATTGAACCTGCCTGAAGAAGGTAAGGCCATTGAAGATGCAGTTAA
AAAGGTTTTGGATGCAGGTATCAGAACTGGTGATTTAGGTGGTTCCAACAGTACCACCGA
AGTCGGTGATGCTGTGCGCGAAGAAGTTAAGAAAATCCTTGCTTAAAAAGATTCTCTTTT
TTTATGATATTTGTACATAAACTTTATAAATGAAATTCATAATAGAAAACGACACGAAATT
ACAAAATGGAATATGTTTCATAGGGTAGACGAACTATATACGCAATCTACATACATTTAT
CAAGAAGGAGAAAAAGGAGGATAGTAAAGGAATACAGGTAAGCAAATTGATACTAATGGC
TCAACGTGATAAGGAAAAAGAATTGCACTTTAACATTAATATTGACAAGGAGGAGGGCAC
CACACAAAAAGTTAGGTGTAACAGAAAATCATGAACTACGATTCTAATTTGATATTGG
AGGATTTTCTCTAAAAAATAACAATAAAAAAACTCAATGACCTGACCAT
TTGATGGAGTTTAAGTCAATACCTTCTTGAACCATTTCCATAATGGTGAAAGTTCCCTC
AAGAATTTTACTCTGTCAGAAACGGCCTTACGACGTAGTCGATATGGTGCACTCTCAGTA
CAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCGCCAACACCCGCTGACG
CGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGACAAGCTGTGACCGTCTCCG
GGAGCTGCATGTGTCAGAGGTTTTACCGTCATCACCGAAACGCGCGA

FIG.94F

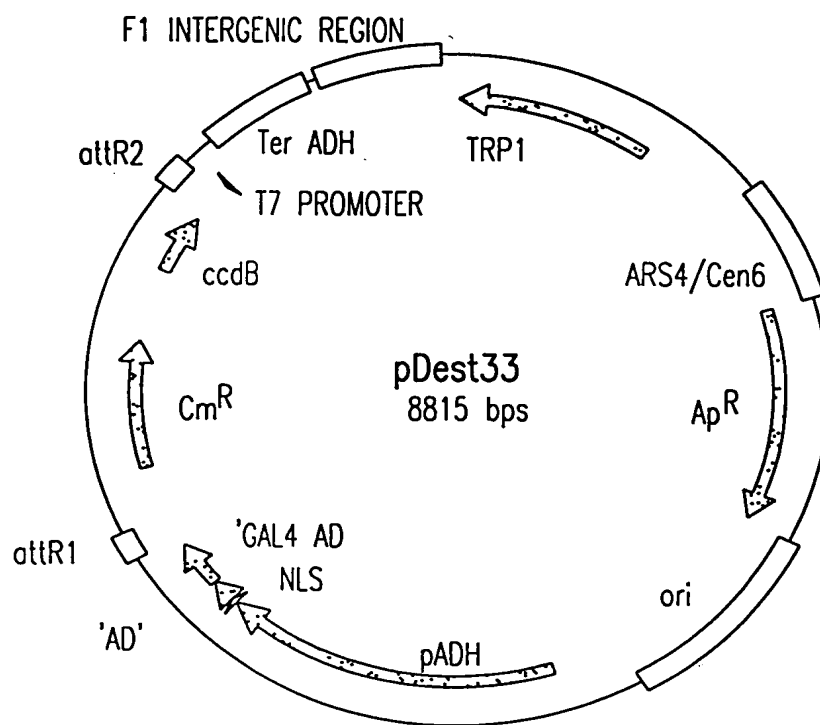


FIG.95A

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GCCTTACGCATCTGTGCGGTATTTACACCGCAGGCAAGTGCACAAACAATACTTAAATA
AATACTACTCAGTAATAACCTATTTCTTAGCATTTTTGACGAAATTTGCTATTTTGTTAG
AGTCTTTTACACCATTGTCTCCACACCTCCGCTTACATCAACACCAATAACGCCATTTA
ATCTAAGCGCATCACCAACATTTTCTGGCGTCAGTCCACCAGCTAACATAAAATGTAAGC
TTTCGGGGCTCTCTTGCCCTTCCAACCCAGTCAGAAATCGAGTTCCAATCCAAAAGTTCAC
CTGTCCCACCTGCTTCTGAATCAAACAAGGGAATAAACGAATGAGGTTTCTGTGAAGCTG
CACTGAGTAGTATGTTGCAGTCTTTTGGAAATACGAGTCTTTTAATAACTGGCAAACCGA
GGAACTCTTGGTATTCTTGCCACGACTCATCTCCATGCAGTTGGACGATATCAATGCCGT
AATCATTGACCAGAGCCAAAACATCCTCCTTAGGTTGATTACGAAACACGCCAACCAAGT
ATTCGGAGTGCCTGAACTATTTTTATATGCTTTTACAAGACTTGAAATTTTCTTGCAA
TAACCGGGTCAATTGTTCTCTTTCTATTGGGCACACATATAATACCCAGCAAGTCAGCAT
CGGAATCTAGAGCACATTCTGCGGCCTCTGTGCTCTGCAAGCCGCAAACTTTCACCAATG
GACCAGAACTACCTGTGAAATTAATAACAGACATACTCCAAGCTGCCTTTGTGTGCTTAA
TCACGTATACTCACGTGCTCAATAGTCACCAATGCCCTCCCTCTTGGCCCTCTCCTTTTC
TTTTTTTCGACCGAATTAATTCTTAATCGGCAAAAAAAGAAAAGCTCCGGATCAAGATTGT
ACGTAAGGTGACAAGCTATTTTTCAATAAAGAATATCTTCCACTACTGCCATCTGGCGTC
ATAACTGCAAAGTACACATATATTACGATGCTGTCTATTAATGCTTCTATATTATATA
TATAGTAATGTCGTTTATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAA
GCCAGCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGG
CATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGGTTTTAC
CGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTA
ATGTCATGATAATAATGGTTTCTTAGGACGGATCGCTTGCCTGTAACCTTACACGCGCCTC
GTATCTTTTAATGATGGAATAATTTGGGAATTTACTCTGTGTTTATTTATTTTATGTTT
TGTATTTGGATTTTAGAAAGTAAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAA
AAATAAACAAGGTTTAAAAATTTCAACAAAAGCGTACTTTACATATATATTTATTAG
ACAAGAAAAGCAGATTAAATAGATATACATTCGATTAACGATAAGTAAATGTAAATCA
CAGGATTTTCGTGTGTGGTCTTCTACACAGACAAGATGAAACAATTCGGCATTAAACCT
GAGAGCAGGAAGAGCAAGATAAAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTA
CATCTTCGGAACAAAAACTATTTTTCTTTAATTTCTTTTTTTACTTTCTATTTTTAA
TTTATATATTTATATTAAAAAATTTAAATTATAATTATTTTTATAGCACGTGATGAAAAG
GACCCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAA
ATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATAT
TGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCGCCCTTATTCCCTTTTTTGCG
GCATTTTGCTTTCCTGTTTTGCTCACCCAGAAACGCTGGTGAAAGTAAAGATGCTGAA
GATCAGTTGGGTGCACGAGTGGGTACATCGAACTGGATCTCAACAGCGGTAAGATCCTT
GAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGT
GGCGCGGTATTATCCCGTATTGACGCGGGCAAGAGCAACTCGGTGCGCGCATACACTAT
TCTCAGAATGACTTGGTTGAGTACTCACCAAGTCACAGAAAAGCATCTTACGGATGGCATG

FIG.95B

ACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAAACTGCGGCCAACTTA
CTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTTCACAACATGGGGGAT
CATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAG
CGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACCTATTAACCTGGCGAA
CTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCA
GGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCC
GGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGT
ATCGTAGTTATCTACACGACGGGCAGTCAGGCAACTATGGATGAACGAAATAGACAGATC
GCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACGTGCAGACCAAGTTTACTCATAT
ATACTTTAGATTGATTTAAAACCTTCATTTTTAATTTAAAAGGATCTAGGTGAAGATCCTT
TTTGATAATCTCATGACCAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCAGAC
CCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGC
TTGCAAACAAAAAACCACCGCTACCAGCGGTGGTTTGTGGCCGATCAAGAGCTACCA
ACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATACCAAATACTGTCTTCTA
GTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCT
CTGCTAATCCTGTTACCAAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTG
GACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGGCTGAACGGGGGGTTGCTGC
ACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCAT
TGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGG
GTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGGAACGCCTGGTATCTTTATAGT
CCTGTGCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGG
CCGAGCCTATGGA AAAACGCCAGCAACGCGCCTTTTTACGGTTCCTGGCCTTTTGCTGG
CCTTTTGCTCACATGTTCTTTCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACC
GCCTTTGAGTGAGCTGATACCGCTCGCCGACGCCGAACGACCGAGCGCAGCGAGTCAGTG
AGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATT
CATTAAATGCAGCTGGCACGACAGGTTTCCCGACTGGAAAGCGGGCAGTGAGCGCAACGCA
ATTAATGTGAGTTACCTCACTCATTAGGCACCCCAGGCTTTACACTTTATGCTTCCGGCT
CCTATGTTGTGTGGAATTGTGAGCGGATAACAATTTACACAGGAAACAGCTATGACCAT
GATTACGCCAAGCTCGGAATTAACCCTCACTAAAGGGAACAAAAGCTGGGTACCGGGCCC
CCCCTCGAGATCCGGGATCGAAGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATG
AAGGCAAAGACAAATATAAGGGTCGAACGAAAAATAAAGTGAAAAGTGTTGATATGATG
TATTTGGCTTTGCGGCGCCGAAAAACGAGTTTACGCAATTGCACAATCATGCTGACTCT
GTGGCGGACCCGCGCTCTTGCCGGCCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCCGGC
GGAGTTTTTTGCGCCTGCATTTTCCAAGTTTACCCTGCGCTAAGGGGCGAGATTGGAGA
AGCAATAAGAATGCCGGTTGGGGTTGCGATGATGACGACCACGACAACTGGTGTCAATTAT
TTAAGTTGCCGAAAGAACCTGAGTGCAATTTGCAACATGAGTATACTAGAAGAATGAGCCA
AGACTTGCGAGACGCGAGTTTGCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAG
GTGAGACGCGCATAACCGCTAGAGTACTTTGAAGAGGAAACAGCAATAGGGTTGCTACCA
GTATAAATAGACAGGTACATAACAACACTGGAAATGGTTGTCTGTTTGAGTACGCTTTCAA
TTCATTTGGGTGTGCACTTTATTATGTTACAATATGGAAGGGAACCTTACACTTCTCCTA
TGCACATATATTAATTAAGTCCAATGCTAGTAGAGAAGGGGGGTAAACACCCCTCCGCGC

FIG.95C

TCTTTTCCGATTTTTTCTAAACCGTGGAATATTTCCGATATCCTTTTGTTGTTTCCGGG
TGTACAATATGGACTTCCTCTTTCTGGCAACCAAACCCATACATCGGGATTCTATAAT
ACCTTCGTTGGTCTCCCTAACATGTAGGTGGCGGAGGGGAGATATACAATAGAACAGATA
CCAGACAAGACATAATGGGCTAAACAAGACTACACCAATTACACTGCCTCATTGATGGTG
GTACATAACGAACATAACTGTAGCCCTAGACTTGATAGCCATCATCATATCGAAGTTTC
ACTACCCTTTTTCCATTTGCCATCTATTGAAGTAATAATAGGCGCATGCAACTTCTTTTC
TTTTTTTTTCTTTTCTCTCTCCCCGTTGTTGTCTCACCATATCCGCAATGACAAAAAA
ATGATGGAAGACACTAAAGGAAAAAATTAACGACAAAGACAGCACCAACAGATGTCGTTG
TTCCAGAGCTGATGAGGGGTATCTTCGAACACACGAACTTTTTCTTCCCTTCATTCACG
CACACTACTCTCTAATGAGCAACGGTATACGGCCTTCCCTCCAGTTACTTGAATTTGAAA
TAAAAAAAGTTTGCCGCTTTGCTATCAAGTATAAATAGACCTGCAATTATTAATCTTTTG
TTTCTCGTCATTGTTCTCGTTCCCTTTCTTCCCTTGTTTCTTTTTCTGCACAATATTTCA
AGCTATACCAAGCATACAATCAACTCCAAGCTTATGCCAAGAAGAAGCGGAAGGTCTCG
AGCGGCGCCAATTTTAATCAAAGTGGGAATATTGCTGATAGCTCATTGTCTTCACTTTC
ACTAACAGTAGCAACGGTCCGAACCTCATAACAACTCAAACAAATTCTCAAGCGCTTTC
CAACCAATTGCCTCCTCTAACGTTTCATGATAACTTCATGAATAATGAAATCACGGCTAGT
AAAATTGATGATGGTAATAATTCAAACCACTGTCACCTGGTTGGACGGACCAAACCTGCG
TATAACGCGTTTGAATCACTACAGGGATGTTTAATACCACTACAATGGATGATGTATAT
AACTATCTATTCGATGATGAAGATACCCACCAAACCCAAAAAAGAGGGTGGGTGCAAT
CAAACAAGTTTGTACAAAAAAGCTGAACGAGAAACGTAAATGATATAAATATCAATATA
TTAAATTAGATTTTGCATAAAAAACAGACTACATAATACTGTAAACACAACATATCCAG
TCACTATGGCGGCCGCTAAGTTGGCAGCATCACCCGACGCACTTTGCGCCGAATAAATAC
CTGTGACGGAAGATCACTTCGCAGAATAAATAAATCCTGGTGTCCCTGTTGATACCGGGA
AGCCCTGGGCCAACTTTTGGCGAAAATGAGACGTTGATCGGCACGTAAGAGGTTCCAAC
TTCACCATAATGAAATAAGATCACTACCGGGCGTATTTTTTGAGTTATCGAGATTTTCAG
GAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACCACCGTTGATATATCCC
AATGGCATCGTAAGAACATTTTGAGGCATTTTCAGTCAGTTGCTCAATGTACCTATAACC
AGACCGTTTCAGCTGGATATTACGGCCTTTTTAAAGACCGTAAAGAAAAATAAGCACAAAGT
TTTATCCGGCCTTTATTCACATTCTTGCCCGCCTGATGAATGCTCATCCGGAATTCGTA
TGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTACCCCTTGTTACACCGTTT
TCCATGAGCAAACCTGAAACGTTTTTCATCGCTCTGGAGTGAATACCACGACGATTTCCGGC
AGTTTCTACACATATATTGCAAGATGTGGCGTGTTACGGTGAAAACCTGGCCTATTTCC
CTAAAGGGTTTATTGAGAATATGTTTTTCGTCTCAGCCAATCCCTGGGTGAGTTTCACCA
GTTTTGATTTAAACGTGGCCAATATGGACAACCTTCTTCGCCCCCGTTTTTACCATGGGCA
AATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTTCAGGTTTCATCATGCCG
TCTGTGATGGCTTCATGTCGGCAGAATGCTTAATGAATTACAACAGTACTGCGATGAGT
GGCAGGGCGGGGCGTAATCTAGAGGATCCGGCTTACTAAAAGCCAGATAACAGTATGCGT
ATTTGCGCGCTGATTTTTGCGGTATAAGAATATATACTGATATGTATACCCGAAGTATGT
CAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGACAGCGACAGCTATCA
GTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCACAAACCATGCAGAAT
GAAGCCCGTCGTCTGCGTGCCGAACGCTGGAAAGCGGAAAATCAGGAAGGGATGGCTGAG

FIG.95D

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GTGCCCCGGTTTATTGAAATGAACGGCTCTTTTGCTGACGAGAACAGGGACTGGTGAAAT
GCAGTTTAAGGTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTGTTTGTGGATGTACA
GAGTGATATTATTGACACGCCCCGGGCGACGGATGGTGATCCCCCTGGCCAGTGCACGTCT
GCTGTCAGATAAAGTCTCCCGTGAACCTTTACCCGGTGGTGCATATCGGGGATGAAAGCTG
GCGCATGATGACCACCGATATGGCCAGTGTGCCGGTCTCCGTTATCGGGGAAGAAGTGGC
TGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTGATGTTCTGGGGAAT
ATAAATGTCAGGCTCCGTTATACACAGCCAGTCTGCAGGTCGACCATAGTGACTGGATAT
GTTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTAATTTAATATATTGA
TATTTATATCATTTTACGTTTCTCGTTACGTTTCTTGACAAAGTGGTTTGATGGCCGC
TAAGTAAGTAAGACGTCGAGCTCCCTATAGTGAGTCGTATTACACTGGCCGTCGTTTTAC
AACGTCGTGACTGGGAAAACACCGGTGAGCTCTAAGTAAGTAACGGCCGCCACCGCGGTG
GAGCTTTGGACTTCTTCGCCAGAGGTTTGGTCAAGTCTCCAATCAAGTTGTGCGCTTGT
CTACCTTGCCAGAAATTTACGAAAAGATGGAAAAGGGTCAAATCGTTGGTAGATACGTTG
TTGACACTTCTAAATAAGCGAATTTCTTATGATTTATGATTTTTATTATTAAATAAGTTA
TAAAAAAATAAGTGTATACAAATTTTAAAGTGACTCTTAGGTTTTAAACGAAAATTCT
TGTTCTTGAGTAACTCTTTCCTGTAGGTGAGGTTGCTTTCTCAGGTATAGCATGAGGTGC
CTCTTATTGACCACACCTCTACCGGCATGCCGAGCAAATGCCTGCAAATCGCTCCCCATT
TCACCCAATTGTAGATATGCTAACTCCAGCAATGAGTTGATGAATCTCGGTGTGTATTTT
ATGTCCTCAGAGGACAATACCTGTTGTAATCGTTCTTCCACACGGATCCGCATCAGGCGA
AATTGTAAACGTTAATATTTTGTAAAATTCGCGTTAAATATTTGTAAATCAGCTCATT
TTTTAACCAATAGGCCGAAATCGGCAAAATCCCTTATAAATCAAAAGAATAGACCGAGAT
AGGGTTGAGTGTTGTTCCAGTTTGGAAACAAGAGTCCACTATTAAGAACGTGGACTCCAA
CGTCAAAGGGCGAAAAACCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACCTA
ATCAAGTTTTTTGGGGTCGAGGTGCCGTAAAGCACTAAATCGGAACCCTAAAGGGAGCCC
CCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGGAAGAAAGC
GAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCGGTCACGCTGCGCGTAACCACCAC
ACCGCCGCGCTTAATGCGCCGCTACAGGGCGCGTCCCATTCGCCATTCACTGCA

FIG.95E

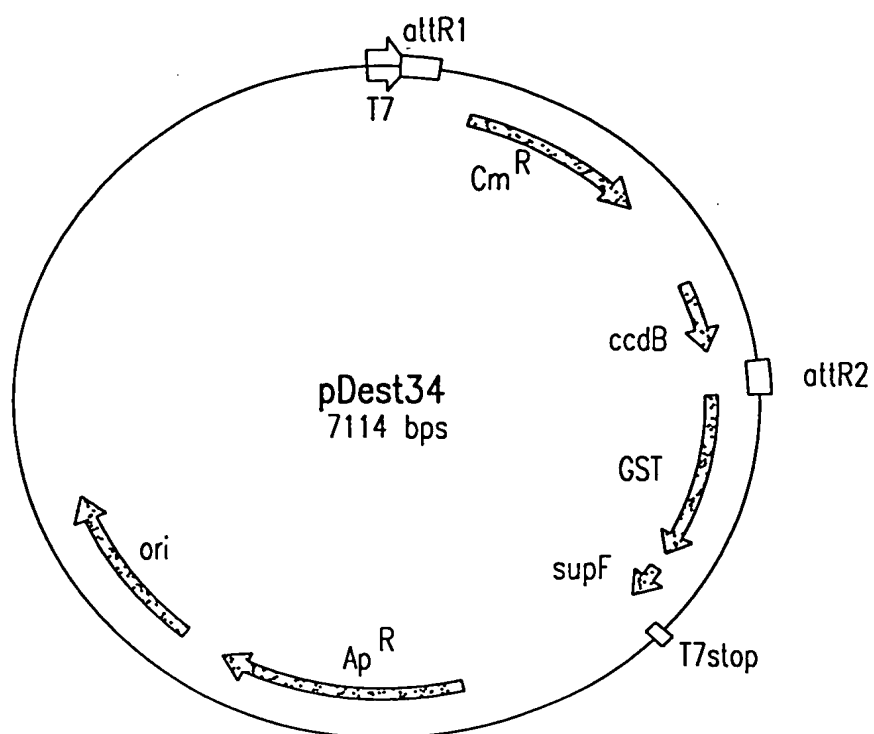


FIG.96A

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pDEST34 7114 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
195..71	attR1
304..963	CmR
1305..1610	ccdB
1651..1775	attR2
1780..2472	GST
2675..2720	T7stop
3334..4194	ampR
4343..4982	ori

ATCGAGATCTCGATCCCGCGAAATTAATACGACTCACTATAGGGAGACCACAACGGTTTC
CCTCTAGATCACAAGTTTGTACAAAAAAGCTGAACGAGAAACGTAAATGATATAAATAT
CAATATATTAAATTAGATTTTGCATAAAAAACAGACTACATAATACTGTAAAACACAACA
TATCCAGTCACTATGGCGGCCGATTAGGCACCCAGGCTTTACACTTTATGCTTCCGGC
TCGTATAATGTGTGGATTTTGAAGTTAGGATCCGGCGAGATTTTCAGGAGCTAAGGAAGCT
AAAATGGAGAAAAAATCACTGGATATACCACCGTTGATATATCCCAATGGCATCGTAAA
GAACATTTTGAGGCATTTCAAGTCAGTTGCTCAATGTACCTATAACCAGACCGTTTCAGCTG
GATATTACGGCCTTTTTAAAGACCGTAAAGAAAAATAAGCACAAGTTTTATCCGGCCTTT
ATTCACATTCTTGCCCGCCTGATGAATGCTCATCCGGAATTCGGTATGGCAATGAAAGAC
GGTGAGCTGGTGATATGGGATAGTGTTACCCCTTGTTACACCGTTTTCCATGAGCAAAT
GAAACGTTTTTCATCGCTCTGGAGTGAATACCACGACGATTTCCGGCAGTTTCTACACATA
TATTCGCAAGATGTGGCGTGTTACGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTATT
GAGAATATGTTTTTCGTCTCAGCCAATCCCTGGGTGAGTTTCACCAGTTTTGATTTAAAC
GTGGCCAATATGGACAACTTCTTCGCCCCGTTTTTACCATGGGCAAAATATTATACGCAA
GGCGACAAGGTGCTGATGCCGCTGGCGATTCAAGTTTCATCATGCCGCTGTGTATGGCTTC
CATGTCCGGCAGAATGCTTAATGAATTACAACAGTACTGCCGATGAGTGGCAGGGCGGGGCG
TAAACGCGTGGATCCGGCTTACTAAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGAT
TTTTGCGGTATAAGAATATATACTGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTG
CTATGAAGCAGCGTATTACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCAT
ATATGATGTCAATATCTCCGGTCTGGTAAGCACAACCATGCAGAATGAAGCCCGTCGTCT
GCGTGCCGAACGCTGGAAAGCGGAAAATCAGGAAGGGATGGCTGAGGTGCCCCGGTTTAT
TGAAATGAACGGCTCTTTTGCTGACGAGAACAGGGACTGGTGAAATGCAGTTTAAGGTTT
ACACCTATAAAAGAGAGAGCCGTTATCGTCTGTTTGTGGATGTACAGAGTGATATTATTG
ACACGCCCCGGGCGACGGATGGTGATCCCCCTGGCCAGTGCACGTCTGCTGTCAGATAAAG
TCTCCCGTGAACCTTTACCCGGTGGTGATATCGGGGATGAAAGCTGGCGCATGATGACCA
CCGATATGGCCAGTGTGCCGGTCTCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACC
GCGAAAATGACATCAAAAACGCCATTAACCTGATGTTCTGGGGAATATAAATGTCAGGCT
CCCTTATACACAGCCAGTCTGCAGGTGCACCATAGTGACTGGATATGTTGTGTTTTACAG
TATTATGTAGTCTGTTTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTT
TACGTTTCTCGTTCAAGCTTTCTTGACAAAGTGGTGATTATGTCCCCTATACTAGGTTAT
TGGAATAATTAAGGGCCTTGTCGAACCCACTCGACTTCTTTTGAATATCTTGAAGAAAAA
TATGAAGAGCATTTGTATGAGCGCATGAAGGTGATAAATGGCGAAACAAAAAGTTTGAA

FIG.96B

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TTGGGTTTGGAGTTTCCCAATCTTCCTTATTATATTGATGGTGATGTTAAATTAACACAG
TCTATGGCCATCATACGTTATATAGCTGACAAGCACAAACATGTTGGGTGGTTGTCCAAAA
GAGCGTGCAGAGATTTCAATGCTTGAAGGAGCGGTTTTGGATATTAGATACGGTGTTTCG
AGAATTGCATATAGTAAAGACTTTGAAACTCTCAAAGTTGATTTTCTTAGCAAGCTACCT
GAAATGCTGAAAATGTTTGAAGATCGTTTATGTCATAAAACATATTTAAATGGTGATCAT
GTAACCCATCCTGACTTCATGTTGTATGACGCTCTTGATGTTGTTTTATACATGGACCCA
ATGTGCCTGGATGCGTTCCCAAAATTAGTTGTTTTAAAAAACGTATTGAAGCTATCCCA
CAAATTGATAAGTACTTGAAATCCAGCAAGTATATAGCATGGCCTTTGCAGGGCTGGCAA
GCCACGTTTGGTGGTGGCGACCATCCTCCAAAATCGGATCTGGTTCCGCGTCCATGGGGA
TCCGGCTGCTAACAAAGCCCGAAAGGAAGCTGAGTTGGCTGCTGCCACCGCTGAGCGCTT
CCCGATAAGGGAGCAGGCCAGTAAAAGCATTACCGTGGTGGGGTTCCCGAGCGGCCAAA
GGGAGCAGACTCTAAATCTGCCGTCATCGACTTCGAAGGTTTGAATCCTTCCCCACCAC
CATCACTTTCAAAGTGAATTCGCTGAGCAATAACTAGCATAACCCCTTGGGGCCTCTAA
ACGGGTCTTGAGGGGTTTTTTGCTGAAAGGAGGAAGTATATCCGGATATCCACAGGACGG
GTGTGGTCGCCATGATCGCGTAGTCGATAGTGGCTCCAAGTAGCGAAGCGAGCAGGACTG
GGCGGCGGCCAAAGCGGTGCGACAGTGCTCCGAGAACGGGTGCGCATAGAAATTGCATCA
ACGCATATAGCGCTAGCAGCACGCCATAGTGAAGTGGCGATGCTGTGCGAATGGACGATAT
CCCGCAAGAGGCCCGGCAGTACCGGCATAACCAAGCCTATGCCTACAGCATCCAGGGTGA
CGGTGCCGAGGATGACGATGAGCGCATTGTTAGATTTATACACGGTGCCTGACTGCGTT
AGCAATTTAACTGTGATAAACTACCGCATTAAAGCTTATCGATGATAAGCTGTCAAACAT
GAGAATTCCTGAAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATG
ATAATAATGGTTTTCTTAGACGTCAGGTGGCACTTTTTCGGGGAAATGTGCGCGGAACCCCT
ATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCCTGA
TAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCGCC
CTTATTCCTTTTTTGCGGCATTTTGCTTCTGTTTTGCTCACCCAGAAACGCTGGTG
AAAGTAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTC
AACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAAGGTTTTCCAATGATGAGCACT
TTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTGTGACGCCGGGCAAGAGCAACTC
GGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAG
CATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGAT
AACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTT
TTGCACAACATGGGGGATCATGTAAGTGCCTTGATCGTTGGGAACCGGAGCTGAATGAA
GCCATACCAAACGACGAGCGTGACACCACGATGCCTGCAGCAATGGCAACAACGTTGCGC
AAACTATTAAGTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATG
GAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTTATT
GCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCA
GATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGAT
GAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAAGTGTCA
GACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTTCATTTTTAATTTAAAGG
ATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCG
TTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTT
CTGCGCGTAATCTGCTGCTTGCAAAACAAAAAACACCGCTACCAGCGGTGGTTTGTG
CCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTTCAGCAGAGCGCAGATA
CCAAATACTGTCTTCTAGTGAGCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCA
CCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAG
TCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCCGGC

FIG.96C

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TGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGA
TACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGG
TATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAAC
GCCTGGTATCTTTATAGTCCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTG
TGATGCTCGTCAGGGGGGCGGAGCCTATGGA AAAACGCCAGCAACGCGGCCCTTTTTACGG
TTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCGTTATCCCCTGATTCT
GTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACC
GAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCTGATGCGGTATTTTCTCCTT
ACGCATCTGTGCGGTATTTACACCCGCATATATGGTGCACTCTCAGTACAATCTGCTCTG
ATGCCGCATAGTTAAGCCAGTATACACTCCGCTATCGCTACGTGACTGGGTCATGGCTGC
GCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATC
CGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGGTTTTACCGTCT
ATCACCGAAACGCGCGAGGCAGCTGCGGTAAAGCTCATCAGCGTGCTGTAAGCGATTCT
ACAGATGTCTGCCTGTTTCATCCGCGTCCAGCTCGTTGAGTTTCTCCAGAAGCGTTAATGT
CTGGCTTCTGATAAAGCGGGCCATGTTAAGGGCGGTTTTCTGTTTGGTCACTGATGC
CTCCGTGTAAGGGGGATTCTGTTTCATGGGGGTAAATGATACCGATGAAACGAGAGAGGAT
GCTCACGATACGGGTTACTGATGATGAACATGCCCGGTTACTGGAACGTTGTGAGGGTAA
ACA ACTGGCGGTATGGATGCGGCGGGACCAGAGAAAAATCACTCAGGGTCAATGCCAGCG
CTTCGTTAATAACAGATGTAGGTGTTCCACAGGGTAGCCAGCAGCATCCTGCGATGCAGAT
CCGGAACATAATGGTGACGGGCGCTGACTTCCGCGTTTCCAGACTTTACGAAACACGGAA
ACCGAAGACCATTTCATGTTGTTGCTCAGGTGCGAGACGTTTTGCGAGCAGCAGTCGCTTCA
CGTTCGCTCGCGTATCGGTGATTCATTCTGCTAACCAGTAAGGCAACCCCGCCAGCCTAG
CCGGGTCTCAACGACAGGAGCACGATCATGCGCACCCGTGGCCAGGACCCAACGCTGCC
CGAGATGCGCCGCGTGCGGCTGCTGGAGATGGCGGACGCGATGGATATGTTCTGCCAAGG
GTTGGTTTGCGCATTACAGTTCTCCGCAAGAATTGATTGGCTCCAATTCTTGGAGTGGT
GAATCCGTTAGCGAGGTGCCGCCGGCTTCCATTCAAGTTCGAGGTGGCCCGGCTCCATGCA
CCGCGACGCAACGCGGGGAGGCAGACAAGGTATAGGGCGGCGCCTACAATCCATGCCAAC
CCGTTCCATGTGCTCGCCGAGGCGGCATAAATCGCCGTGACGATCAGCGGTCCAGTGATC
GAAGTTAGGCTGGTAAGAGCCGCGAGCGATCCTTGAAGCTGTCCCTGATGGTCGTCTATCT
ACCTGCCTGGACAGCATGGCCTGCAACGCGGGCATCCCGATGCCGCCGGAAGCGAGAAGA
ATCATAATGGGGAAGGCCATCCAGCCTCGCGTCGCGAACGCCAGCAAGACGTAGCCCAGC
GCGTCGGCCGCCATGCCGGCGATAATGGCCTGCTTCTCGCCGAAACGTTTGGTGGCGGGA
CCAGTGACGAAGGCTTGAGCGAGGGCGTGCAAGATTCCGAATACCGCAAGCGACAGGCCG
ATCATCGTCGCGCTCCAGCGAAAGCGGTCTCGCCGAAAATGACCCAGAGCGCTGCCGGC
ACCTGTCTACGAGTTGCATGATAAAGAAGACAGTCATAAGTGCGGCGACGATAGTCATG
CCCCGCGCCACCGGAAGGAGCTGACTGGGTTGAAGGCTCTCAAGGGCATCGGTGATCG
ACGCTCTCCCTTATGCGACTCCTGCATTAGGAAGCAGCCAGTAGTAGGTTGAGGCCGTT
GAGCACCGCCGCCGCAAGGAATGGTGATGCAAGGAGATGGCGCCCAACAGTCCCCGGC
CACGGGGCCTGCCACCATACCCACGCCGAAACAAGCGCTCATGAGCCCGAAGTGGCGAGC
CCGATCTTCCCATCGGTGATGTGCGCGATATAGGCGCCAGCAACCGCACCTGTGGCGCC
GGTGATGCCGGCCACGATGCGTCCGGCGTAGAGG

FIG.96D

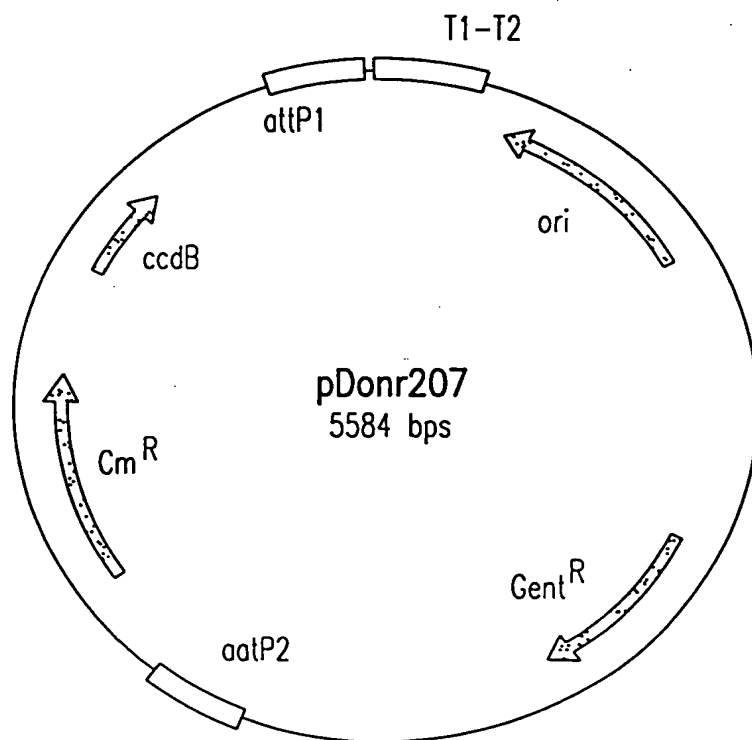


FIG.97A

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pDONR207 5584 bp

GCGAGAGTAGGGAACCTGCCAGGCATCAAATAAAACGAAAGGCTCAGTCGGAAGACTGGGC
CTTTTCGTTTTATCTGTTGTTTGTCTGGTGAACGCTCTCCTGAGTAGGACAAATCCGCCGGG
AGCGGATTTGAACGTTGTGAAGCAACGGCCCGAGGGTGGCGGGCAGGACGCCCGCCATA
AACTGCCAGGCATCAAATAAGCAGAAGGCCATCCTGACGGATGGCCTTTTTGCGTTTTCT
ACAAACTCTTCTGGCTAGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGA
AAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTG
GCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAATCGACGCTCAAGTCAG
AGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTC
GTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCTTTCTCCCTTCG
GGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTGCTT
CGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTACGCCCGACCGCTGCGCCTTATCC
GGTAACATATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCC
ACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGG
TGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCA
GTTACCTTCGGA AAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGC
GGTGGTTTTTTTTGTTTGAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGAT
CCTTTGATCTTTTTCTACGGGGTCTGACGCTCAGTGAACGAAAACCTCACGTTAAGGGATT
TTGGTCATGAGCTTGCGCCGTCCCGTCAAGTCAGCGTAATGCTCTGCCAGTGTTACAACC
AATTAACCAATTCTGATTAGAAAACTCATCGAGCATCAAATGAAACTGCAATTTATTCA
TATCAGGATTATCAATACCATATTTTTGAAAAAGCCGTTTCTGTAATGAAGGAGAAAACT
CACCGAGGCAGTTCCATAGGATGGCAAGATCCTGGTATCGGTCTGCGATTCCGACTCGTC
CAACATCAATACAACCTATTAGTAGCCAACCACTAGAACTATAGCTAGAGTCTGGGCGA
ACAAACGATGCTCGCCTTCCAGAAAACCGAGGATGCGAACCACCTTCATCCGGGGTCAGCA
CCACCGGCAAGCGCCGCGACGGCCGAGGTCTTCCGATCTCCTGAAGCCAGGGCAGATCCG
TGCACAGCACCTTGCCGTAGAAGAACAGCAAGGCCGCAATGCCTGACGATGCGTGGAGA
CCGAAACCTTGCGCTCGTTGCGCAGCCAGGACAGAAATGCCTCGACTTCGCTGCTGCCCA
AGGTTGCCGGGTGACGCACACCGTGGAACGGATGAAGGCACGAACCCAGTTGACATAAG
CCTGTTGCGTTGCTAAACTGTAATGCAAGTAGCGTATGCGCTCACGCAACTGGTCCAGAA
CCTTGACCGAACGCAGCGGTGGTAACGGCGCAGTGGCGGTTTTTCATGGCTTGTTATGACT
GTTTTTTTTGTACAGTCTATGCCTCGGGCATCCAAGCAGCAAGCGCGTTACGCCGTGGGTC
GATGTTTGATGTTATGGAGCAGCAACGATGTTACGCAGCAGCAACGATGTTACGCAGCAG
GGCAGTCGCCCTAAAACAAAGTTAGGTGGCTCAAGTATGGGCATCATTGCGACATGTAGG
CTCGGCCCTGACCAAGTCAAATCCATGCGGGCTGCTCTTGATCTTTTCGGTCTGAGTTC
GGAGACGTAGCCACCTACTCCCAACATCAGCCGGACTCCGATTACCTCGGGAACCTTGCTC
CGTAGTAAGACATTCATCGCGTTGCTGCCTTCGACCAAGAAGCGGTTGTTGGCGCTCTC
GCGGCTTACGTTCTGCCAGGTTTGAGCAGCCGCGTAGTGAGATCTATATCTATGATCTC
GCAGTCTCCGGCGAGCACCGGAGGCAGGGCATTGCCACCGCGCTCATCAATCTCCTCAAG
CATGAGGCCAACGCGCTTGGTGCTTATGTGATCTACGTGCAAGCAGATTACGGTGACGAT
CCCGCAGTGGCTCTCTATACAAAGTTGGGCATACGGGAAGAAGTGATGCACTTTGATATC
GACCCAAGTACCGCCACCTAACAATTGTTCAAGCCGAGATCGGCTTCCCGGCCTAATTT
CCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCACCATGAGTGACGACTGAATCCGG
TGAGAATGGCAAAAGTTTATGCATTTCTTTCCAGACTTGTTCAACAGGCCAGCCATTACG
CTCGTCATCAAAATCACTCGCATCAACCAACCGTTATTCAATTCGTGATTGCGCCTGAGC
GAGACGAAATACGCGATCGCTGTTAAAAGGACAATTACAAACAGGAATCGAATGCAACCG
GCGCAGGAACACTGCCAGCGCATCAACAATATTTTACCTGAATCAGGATATTCTTCTAA
TACCTGGAATGCTGTTTTTCCGGGGATCGCAGTGGTGAGTAACCATGCATCATCAGGAGT
ACGGATAAAATGCTTGATGGTCGGAAGAGGCATAAATTCCGTGAGCCAGTTTAGTCTGAC
CATCTCATCTGTAACATCATTGGCAACGCTACCTTTGCCATGTTTCAGAAACAACCTCTGG

FIG.97B

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CGCATCGGGCTTCCCATACAAGCGATAGATTGTCGCACCTGATTGCCCGACATTATCGCG
AGCCCATTTATACCCATATAAATCAGCATCCATGTTGGAATTTAATCGCGGCCTCGACGT
TTCCCGTTGAATATGGCTCATAACACCCCCTGTATTACTGTTTATGTAAGCAGACAGTTT
TATTGTTTCATGATGATATATTTTTATCTTGTGCAATGTAACATCAGAGATTTTGAGACAC
GGGCCAGAGCTGCAGCTGGATGGCAAATAATGATTTTATTTTGAAGTATAGTGACCTGTT
CGTTGCAACAAATTGATAAGCAATGCTTTCTTATAATGCCAACTTTGTACAAGAAAGCTG
AACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCATAAAAAAC
AGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGAATCAACTACTTAGATG
GTATTAGTGACCTGTAGTCGACTAAGTTGGCAGCATCACCCGACGCACTTTGCGCCGAAT
AAATACCTGTGACGGAAGATCACTTCGCAGAATAAATAAATCCTGGTGTCCCTGTTGATA
CCGGGAAGCCCTGGGCCAACTTTGGCGAAAATGAGACGTTGATCGGCACGTAAGAGGTTT
CAACTTTACCATTAATGAAATAAGATCACTACCGGGCGTATTTTTGAGTTATCGAGATT
TTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAAATCACTGGATATACCACCGTTGATAT
ATCCCAATGGCATCGTAAAGAACATTTTGAGGCATTTAGTCAGTTGCTCAATGTACCTA
TAACCAGACCGTTTCAGCTGGATATTACGGCCTTTTTAAAGACCGTAAAGAAAAATAAGCA
CAAGTTTTATCCGGCCTTTATTCACATTCTTGCCCGCCTGATGAATGCTCATCCGGAATT
CCGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTACCCCTTGTTACAC
CGTTTTCCATGAGCAAACTGAAACGTTTTTCATCGCTCTGGAGTGAATACCACGACGATTT
CCGGCAGTTTTCTACACATATATTCGCAAGATGTGGCGTGTTACGGTGAAAACCTGGCCTA
TTTCCCTAAAGGGTTTATTGAGAATATGTTTTTCGTCTCAGCCAATCCCTGGGTGAGTTT
CACCAGTTTTGATTTAAACGTGGCCAATATGGACAACCTTTCGCCCCCGTTTTACCAT
GGGCAAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTGAGTTTCATCA
TGCCGTCTGTGATGGCTTCCATGTCCGCAGAATGCTTAATGAATTACAACAGTACTGCGA
TGAGTGGCAGGGCGGGGCGTAATCGCGTGGATCCGGCTTACTAAAAGCCAGATAACAGTA
TGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAAATATATACTGATATGTATACCCGAAG
TATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGACAGCGACAGC
TATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCACAAACCATGC
AGAATGAAGCCCGTCTGCTGCGTGCCGAACGCTGGAAAGCGGAAAATCAGGAAGGGATGG
CTGAGGTGCCCCGTTTTATTGAAATGAACGGCTCTTTTGCTGACGAGAACAGGGACTGGT
GAAATGCAGTTTAAAGTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTGTTTGTGGAT
GTACAGAGTGATATTATTGACACGCCCGGGCGACGGATGGTGATCCCCCTGGCCAGTGCA
CGTCTGCTGTGATGATAAAGTCTCCCGTGAACCTTACCCGGTGGTGATATCGGGGATGAA
AGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGGTCTCCGTTATCGGGGAAGAA
GTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTGATGTTCTGG
GGAATATAAATGTCAGGCTCCCTTATACACAGCCAGTCTGCAGGTCGATACAGTAGAAAT
TACAGAACTTTATCACGTTTAGTAAGTATAGAGGCTGAAAATCCAGATGAAGCCGAACG
ACTTGTAAGAGAAAAGTATAAGAGTTGTGAAATTGTTCTTGATGCAGATGATTTTCAGGA
CTATGACACTAGCGTATATGAATAGGTAGATGTTTTTATTTTGTACACAAAAAAGAGGC
TCGCACCTCTTTTTCTTATTTCTTTTTATGATTTAATACGGCATTGAGGACAATAGCGAG
TAGGCTGGATACGACGATTCCGTTTGAGAAGAACATTTGGAAGGCTGTCGGTCGACTAAG
TTGGCAGCATCACCCGAAGAACATTTGGAAGGCTGTCGGTCGACTACAGGTCATAATAC
CATCTAAGTAGTTGATTCATAGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCT
GTTTTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTT
CAGCTTTTTTGTACAAAGTTGGCATTATAAAAAAGCATTGCTCATCAATTTGTTGCAACG
AACAGGTCACTATCAGTCAAAATAAATCATTATTTGGGGCCCGAGATCCATGCTAGCGT
TAAC

FIG.97C

pMAB85

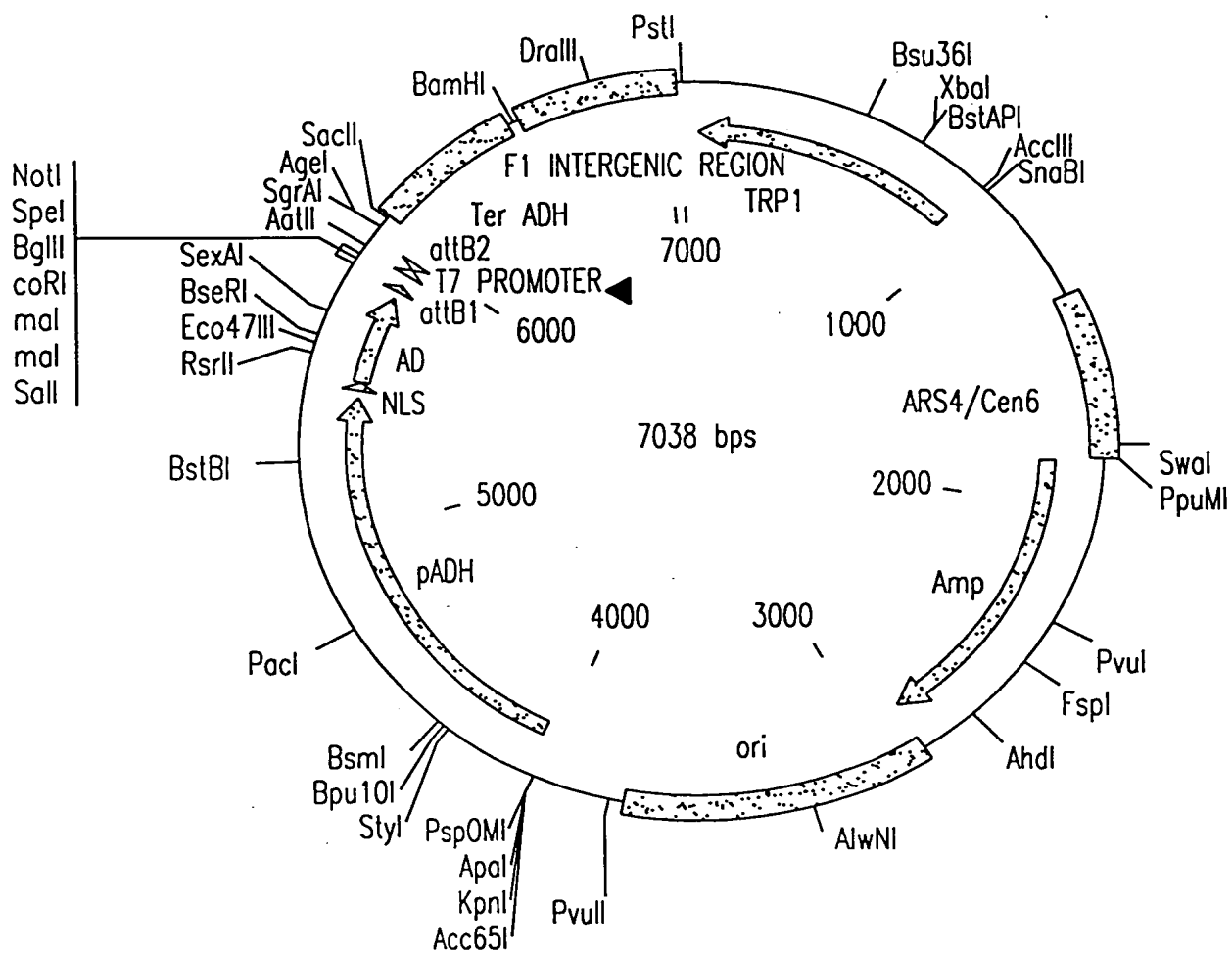


FIG.98A

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pMAB85 7038 bp

GCCTTACGCATCTGTGCGGTATTTACACCGCAGGCAAGTGCACAAACAATACTTAAATA
AATACTACTCAGTAATAACCTATTTCTTAGCATTTTTGACGAAATTTGCTATTTTGTTAG
AGTCTTTTACACCATTTGTCTCCACACCTCCGCTTACATCAACACCAATAACGCCATTTA
ATCTAAGCGCATCACCAACATTTTCTGGCGTCAGTCCACCAGCTAACATAAAATGTAAGC
TTTCGGGGCTCTCTTGCTTCCAACCCAGTCAGAAATCGAGTTCCAATCCAAAAGTTCAC
CTGTCCCACCTGCTTCTGAATCAAACAAGGGAATAAACGAATGAGGTTTCTGTGAAGCTG
CACTGAGTAGTATGTTGCAGTCTTTTGAAATACGAGTCTTTTAATAACTGGCAAACCGA
GGAATCTTGGTATTCTTGCCACGACTCATCTCCATGCAGTTGGACGATATCAATGCCGT
AATCATTGACCAGAGCCAAAACATCCTCCTTAGGTTGATTACGAAACACGCCAACCAAGT
ATTTCCGAGTGCCTGAACTATTTTTATATGCTTTTACAAGACTTGAAATTTTCTTGCAA
TAACCGGGTCAATTGTTCTCTTTCTATTGGGCACACATATAATACCCAGCAAGTCAGCAT
CGGAATCTAGAGCACATTCTGCGGCCTCTGTGCTCTGCAAGCCGCAAACCTTTCACCAATG
GACCAGAACTACCTGTGAAATTAATAACAGACATACTCCAAGCTGCCTTTGTGTGCTTAA
TCACGTATACTCACGTGCTCAATAGTCACCAATGCCCTCCCTCTTGCCCTCTCCTTTTC
TTTTTTCGACCGAATTAATTCTTAATCGGCAAAAAAAGAAAAGCTCCGGATCAAGATTGT
ACGTAAGGTGACAAGCTATTTTTCAATAAAGAATATCTTCCACTACTGCCATCTGGCGTC
ATAACTGCAAAGTACACATATATTACGATGCTGTCTATTAAATGCTTCCTATATTATATA
TATAGTAATGTCGTTTATGGTGCCTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAA
GCCAGCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGCTGCTCCCGG
CATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTAC
CGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTA
ATGTCATGATAATAATGGTTTCTTAGGACGGATCGCTTGCCTGTAACCTTACACGCGCCTC
GTATCTTTTAATGATGGAATAATTTGGGAATTTACTCTGTGTTTATTTATTTTTATGTTT
TGTATTTGGATTTTAGAAAGTAAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAA
AAATAAACAAAGGTTTAAAAAATTTCAACAAAAAGCGTACTTTACATATATATTTATTAG
ACAAGAAAAGCAGATTAAATAGATATACATTGATTAACGATAAGTAAAATGTAAAATCA
CAGGATTTTTCGTGTGTGGTCTTCTACACAGACAAGATGAAACAATTCCGGCATTAACTCT
GAGAGCAGGAAGAGCAAGATAAAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTA
CATCTTCGGAAAACAAAACTATTTTTCTTTAATTTCTTTTTTTACTTTCTATTTTTAA
TTTATATATTTATATTAATAAATAATTATAATTATTTTTATAGCACGTGATGAAAAG
GACCCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAA
ATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATAT
TGAAAAAGGAAGAGTATGAGTATTCACATTTCCGTGTCGCCCTTATTCCTTTTTTTGCG
GCATTTTGCCTTCCTGTTTTTGTCTACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAA
GATCAGTTGGGTGCACGAGTGGGTACATCGAAGTGGATCTCAACAGCGGTAAGATCCTT
GAGAGTTTTCGCCCCGAAGAAGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGT
GGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTGCGCGCATACACTAT
TCTCAGAATGACTTGGTTGAGTACTACCAAGTCACAGAAAAGCATCTTACGGATGGCATG

FIG.98B

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ACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAAACTGCGGCCAACTTA
CTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTTCACAACATGGGGGAT
CATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAG
CGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACCTATTAACCTGGCGAA
CTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCA
GGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCC
GGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGT
ATCGTAGTTATCTACACGACGGGCAGTCAGGCAACTATGGATGAACGAAATAGACAGATC
GCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACCTGTCAGACCAAGTTTACTCATAT
ATACTTTAGATTGATTTAAAACCTTCATTTTTTAATTTAAAAGGATCTAGGTGAAGATCCTT
TTTGATAATCTCATGACCAAATCCCTTAACGTGAGTTTTTCGTTCCACTGAGCGTCAGAC
CCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGC
TTGCAAACAAAAAACCACCGCTACCAGCGGTGGTTTGTGTTGCCGGATCAAGAGCTACCA
ACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATACCAAATACTGTCTTCTA
GTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCT
CTGCTAATCCTGTTACCACTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTG
GACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTGCGGCTGAACGGGGGGTTCTGTC
ACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCAT
TGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGG
GTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGGAACGCCTGGTATCTTTATAGT
CCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGG
CCGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGG
CCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACC
GCCTTTGAGTGAGCTGATACCGCTCGCCGACGCCGAACGACCGAGCGCAGCGAGTCAGTG
AGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATT
CATTAAATGCAGCTGGCACGACAGGTTTCCGACTGGAAAGCGGGCAGTGAGCGCAACGCA
ATTAATGTGAGTTACCTCACTCATTAGGCACCCCAGGCTTTACACTTTATGCTTCCGGCT
CCTATGTTGTGTGGAATTGTGAGCGGATAACAATTTACACAGGAAACAGCTATGACCAT
GATTACGCCAAGCTCGGAATTAACCCTCACTAAAGGGAACAAAAGCTGGGTACCGGGGCC
CCCCTCGAGATCCGGGATCGAAGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATG
AAGGCAAAAGACAAATATAAGGGTCGAACGAAAAATAAAGTGAAAAGTGTTGATATGATG
TATTTGGCTTTGCGGCGCCGAAAAACGAGTTTACGCAATTGCACAATCATGCTGACTCT
GTGGCGGACCCGCGCTCTTGCCGGCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCCGGC
GGAGTTTTTTGCGCCTGCATTTTCCAAGTTTACCCTGCGCTAAGGGGCGAGATTGGAGA
AGCAATAAGAATGCCGGTTGGGGTTGCGATGATGACGACCACGACAACCTGGTGTCAATTAT
TTAAGTTGCCGAAAGAACCTGAGTGCAATTTGCAACATGAGTATACTAGAAGAATGAGCCA
AGACTTGCGAGACGCGAGTTTGCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAG
GTGAGACGCGCATAACCGCTAGAGTACTTTGAAGAGGAAACAGCAATAGGGTTGCTACCA
GTATAAATAGACAGGTACATACAACCTGGAATGGTTGTCTGTTTGAGTACGCTTTCAA
TTCATTTGGGTGTGCACTTTATTATGTTACAATATGGAAGGGAACTTTACACTTCTCCTA
TGCACATATATTAATTAAGTCCAATGCTAGTAGAGAAGGGGGGTAACACCCCTCCGCGC

FIG.98C

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TCTTTTCCGATTTTTTTCTAAACCGTGGAATATTTCCGATATCCTTTTGTTGTTTCCGGG
TGTACAATATGGACTTCCTCTTTTCTGGCAACCAAACCCATACATCGGGATTCTATAAT
ACCTTCGTTGGTCTCCCTAACATGTAGGTGGCGGAGGGGAGATATACAATAGAACAGATA
CCAGACAAGACATAATGGGCTAAACAAGACTACACCAATTACACTGCCTCATTGATGGTG
GTACATAACGAACATAACTGTAGCCCTAGACTTGATAGCCATCATCATATCGAAGTTTC
ACTACCCTTTTTCCATTTGCCATCTATTGAAGTAATAATAGGCGCATGCAACTTCTTTTC
TTTTTTTTCTTTTCTCTCTCCCCGTTGTTGTCTCACCATATCCGCAATGACAAAAAA
ATGATGGAAGACACTAAAGGAAAAAATTAACGACAAAGACAGCACCAACAGATGTCGTTG
TTCCAGAGCTGATGAGGGGTATCTTCGAACACACGAACTTTTTCTTCCTTCATTACG
CACACTACTCTCTAATGAGCAACGGTATACGGCCTTCCTTCAGTTACTTGAATTTGAAA
TAAAAAAAGTTTGCCGCTTTGCTATCAAGTATAAATAGACCTGCAATTATTAATCTTTTG
TTTCTCGTCATTGTTCTCGTTCCCTTTCTTCCTTGTTTCTTTTTCTGCACAATATTTCA
AGCTATACCAAGCATACAATCAACTCCAAGCTTATGCCCAAGAAGAAGCGGAAGGTCTCG
AGCGGCGCCAATTTAATCAAAGTGGGAATATTGCTGATAGCTCATTGTCCTTCACTTTC
ACTAACAGTAGCAACGGTCCGAACCTCATAACAACTCAAACAAATTCTCAAGCGCTTTC
CAACCAATTGCCTCCTCTAACGTTTCATGATAACTTCATGAATAATGAAATCACGGCTAGT
AAAATTGATGATGGTAATAATTCAAACCACTGTCACCTGGTTGGACGGACCAAACCTGCG
TATAACGCGTTTGAATCACTACAGGGATGTTTAATACCACTACAATGGATGATGTATAT
AACTATCTATTGATGATGAAGATACCCACCAAACCCAAAAAAGAGGGTGGGTGCGATC
ACAAGTTTGTACAAAAAGCAGGCTTGTGACCCCGGGAATTCAGATCTACTAGTGCGGC
CGCACGCGTACCCAGCTTTCTTGACAAAGTGGTGACGTCGAGCTCCCTATAGTGAGTCG
TATTACACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACACCGGTGAGCTCTAAGT
AAGTAACGGCCGCCACCGCGGTGGAGCTTTGGACTTCTTCGCCAGAGGTTTGGTCAAGTC
TCCAATCAAGGTTGTCGGCTTGTCTACCTTGCCAGAAATTTACGAAAAGATGGAAAAGGG
TCAAATCGTTGGTAGATACGTTGTTGACACTTCTAAATAAGCGAATTTCTTATGATTTAT
GATTTTTATTATTAATAAGTTATAAAAAAATAAGTGTATACAAATTTTAAAGTGACTC
TTAGGTTTTAAACGAAAATTCTTGTTCTTGAGTAACCTTTCTGTAGGTCAGGTTGCT
TTCTCAGGTATAGCATGAGGTCGCTCTTATTGACCACACCTCTACCGGCATGCCGAGCAA
ATGCCTGCAAATCGCTCCCCATTTACCCCAATTGTAGATATGCTAACTCCAGCAATGAGT
TGATGAATCTCGGTGTGTATTTTATGTCCTCAGAGGACAATACCTGTTGTAATCGTTCTT
CCACACGGATCCGCATCAGGCGAAATTGTAACGTTAATATTTTGTTAAAATTTCGCGTTA
AATATTTGTAAATCAGCTCATTTTTTAACCAATAGGCCGAAATCGGCAAAATCCCTTAT
AAATCAAAGAATAGACCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAAACAAGAGTCCA
CTATTAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAACCGTCTATCAGGGCGATGGC
CCACTACGTGAACCATCACCTAATCAAGTTTTTTGGGGTCGAGGTGCCGTAAAGCACTA
AATCGGAACCCTAAAGGGAGCCCCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTG
GCGAGAAAGGAAGGGAAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG
GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGCGTCC
CATTCGCCATTCACTGCA

FIG.98D

pMAB86

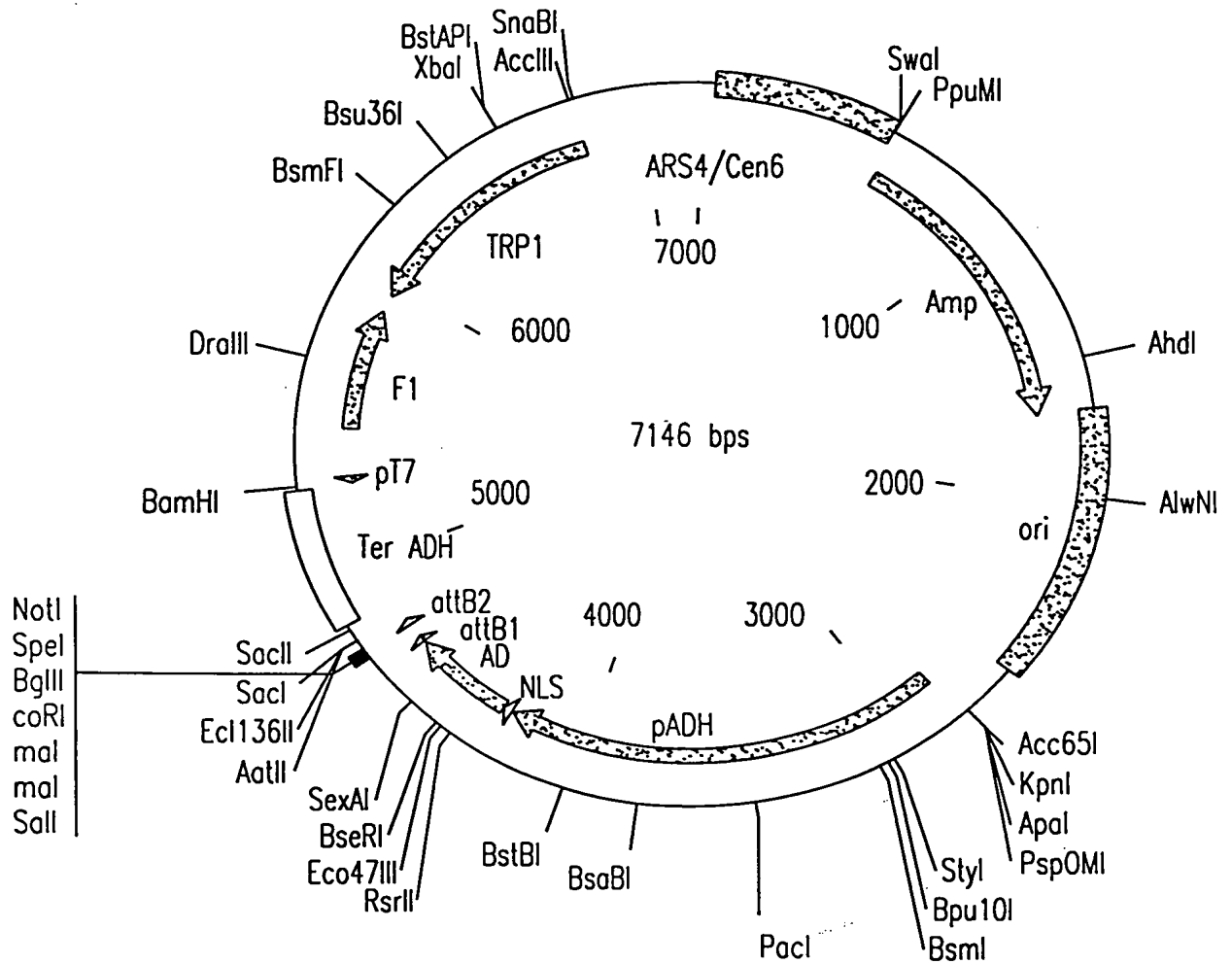


FIG.99A

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pMAB86 7146 bp

GACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTT
CTTAGGACGGATCGCTTGCTGTAACCTACACGCGCCTCGTATCTTTTAATGATGGAATA
ATTTGGGAATTTACTCTGTGTTTATTTATTTTTATGTTTTGTATTTGGATTTTAGAAAGT
AAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAAAATAAACAAAGGTTTAAAAA
ATTTCAACAAAAAGCGTACTTTACATATATATTTATTAGACAAGAAAAGCAGATTAAATA
GATATACATTTCGATTAAACGATAAGTAAATGTAAATCACAGGATTTTCGTGTGTGGTCT
TCTACACAGACAAGATGAAACAATTCGGCATTAAACCTGAGAGCAGGAAGAGCAAGATA
AAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTACATCTTCGGAAAACAAAACT
ATTTTTCTTTAATTTCTTTTTTACTTTCTATTTTTAATTTATATATTTATATTTAAAAA
ATTTAAATTATAATTATTTTTATAGCACGTGATGAAAAGGACCCAGGTGGCACTTTTCGG
GGAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCG
CTCATGAGACAATAACCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGT
ATTCAACATTTCCGTGTGCGCCTTATTCCCTTTTTTTCGGCATTTTGCCTTCCTGTTTTT
GCTACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTG
GGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAA
CGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATT
GACGCCGGGCAAGAGCAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAG
TACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGT
GCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGA
CCGAAGGAGCTAACCGCTTTTTTTTCAACATGGGGGATCATGTAACCTCGCCTTGATCGT
TGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTA
GCAATGGCAACAACGTTGCGCAAACCTATTAACCTGGCGAACTACTTACTCTAGCTTCCCGG
CAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCC
CTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGT
ATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACG
GGCAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTG
ATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAA
CTTCATTTTTTAATTTAAAAGGATCTAGGTGAAGATCCTTTTTTGATAATCTCATGACCAA
ATCCCTTAACGTGAGTTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGA
TCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCG
CTACCAGCGGTGGTTTGTGTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAC
GGCTTCAGCAGAGCGCAGATACCAAATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCAC
CACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAAGTG
GCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCG
GATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGA
ACGACCTACACCGAACTGAGATACCTACAGCGTGAGCATTGAGAAAGCGCCACGCTTCCC
GAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTTCGGAACAGGAGAGCGCACG
AGGGAGCTTCCAGGGGGGAACGCCTGGTATCTTTATAGTCCTGTGCGGTTTCGCCACCTC

FIG.99B

TGA CTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCC
 AGCAACGCGGCCTTTTTACGGTTCTTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTT
 CCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACC
 GCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGC
 CCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCTGGCACGAC
 AGGTTTCCCGACTGGAAAGCGGGCAGTGAGCGCAACGCAATTAATGTGAGTTACCTCACT
 CATTAGGCACCCCAGGCTTTACACTTTATGCTTCCGGCTCCTATGTTGTGTGGAATTGTG
 AGCGGATAACAATTTACACAGGAAACAGCTATGACCATGATTACGCCAAGCTCGGAATT
 AACCTCACTAAAGGGAACAAAAGCTGGGTACCGGGCCCCCCTCGAGATCCGGGATCGA
 AGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATGAAGGCAAAAGACAAATATAAG
 GGTGCAACGAAAAATAAGTGAAAAGTGTTGATATGATGTATTTGGCTTTGCGGCGCCGA
 AAAAACGAGTTTACGCAATTGCACAATCATGCTGACTCTGTGGCGGACCCGCGCTCTTGC
 CGGCCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCGCGGAGTTTTTTGCGCCTGCATT
 TTCCAAGTTTACCCTGCGCTAAGGGGCGAGATTGGAGAAGCAATAAGAATGCCGGTTGG
 GGTTGCGATGATGACGACCACGACAACCTGGTGTCATTATTTAAGTTGCCGAAAGAACCTG
 AGTGCAATTTGCAACATGAGTATACTAGAAGAATGAGCCAAGACTTGCGAGACGCGAGTTT
 GCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAGGTGAGACGCGCATAACCGCTA
 GAGTACTTTGAAGAGGAAACAGCAATAGGGTTGCTACCAGTATAAATAGACAGGTACATA
 CAACACTGGAAATGGTTGTCTGTTTGAGTACGCTTTCAATTCATTTGGGTGTGCACTTTA
 TTATGTTACAATATGGAAGGGAACCTTTACACTTCTCCTATGCACATATATTAATTAAGT
 CCAATGCTAGTAGAGAAGGGGGTAACACCCCTCCGCGCTCTTTCCGATTTTTTTCTAA
 ACCGTGGAATATTTCCGATATCCTTTTGTTGTTTCCGGGTGTACAATATGGACTTCCTCT
 TTTCTGGCAACCAAACCCATACATCGGGATTCTATAATACCTTCGTTGGTCTCCCTAAC
 ATGTAGGTGGCGGAGGGGAGATATACAATAGAACAGATACCAGACAAGACATAATGGGCT
 AAACAAGACTACACCAATTACACTGCCTCATTGATGGTGGTACATAACGAACTAATACTG
 TAGCCCTAGACTTGATAGCCATCATCATATCGAAGTTTCACTACCTTTTTCCATTTGCC
 ATCTATTGAAGTAATAATAGGCGCATGCAACTTCTTTCTTTTTTTTTCTTTCTCTCTC
 CCCCCTTGTGTCTCACCATATCCGCAATGACAAAAAAATGATGGAAGACACTAAAGGA
 AAAAATTAACGACAAAGACAGCACCAACAGATGTCGTTGTTCCAGAGCTGATGAGGGGTA
 TCTTCGAACACACGAACTTTTTCTTCTTCATTACGCACACTACTCTCTAATGAGCA
 ACGGTATACGGCCTTCTTCCAGTTACTTGAATTTGAAATAAAAAAAGTTTGCCGCTTG
 CTATCAAGTATAAATAGACCTGCAATTATTAATCTTTGTTTCTCGTCATTGTTCTCGT
 TCCCTTTCTTCTTGTCTTTTTCTGCACAATATTTCAAGCTATACCAAGCATACAATC
 AACTCCAAGCTTATGCCCAAGAAGAAGCGGAAGGTCTCGAGCGGCGCCAATTTTAATCAA
 AGTGGGAATATTGCTGATAGCTCATTGTCTTCACTTTCACTAACAGTAGCAACGGTCCG
 AACCTCATAAACAACCAAATCTCAAGCGCTTTCACAACCAATTGCCTCCTCTAAC
 GTTCATGATAACTTCATGAATAATGAAATCACGGCTAGTAAAATTGATGATGGTAATAAT
 TCAAAACCACTGTCACCTGGTTGGACGGACCAAACCTGCGTATAACGCGTTTGGAATCACT
 ACAGGGATGTTTAATACCACTACAATGGATGATGTATATACTATCTATTCGATGATGAA
 GATACCCACCAAACCCAAAAAAGAGGGTGGGTGCGATACAAGTTTGTACAAAAAAGCA
 GGCTTGTCGACCCCGGAATTCAGATCTACTAGTGCGGCCGCACGCGTACCCAGCTTTCT

FIG.99C

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TGTACAAAGTGGTGACGTCGAGCTCTAAGTAAGTAACGGCCGCCACCGCGGTGGAGCTTT
GGACTTCTTCGCCAGAGGTTTGGTCAAGTCTCCAATCAAGGTTGTCGGCTTGTCTACCTT
GCCAGAAATTTACGAAAAGATGGAAAAGGGTCAAATCGTTGGTAGATACGTTGTTGACAC
TTCTAAATAAGCGAATTTCTTATGATTTATGATTTTTATTATTAAATAAGTTATAAAAAA
AATAAGTGTATACAAATTTTAAAGTGA CTCTTAGGTTTTAAAACGAAAATTCTTGTTCTT
GAGTAACTCTTTCCTGTAGGTCAGGTTGCTTTCAGGTATAGCATGAGGTCGCTCTTAT
TGACCACACCTCTACCGGCATGCCGAGCAAATGCCTGCAAATCGCTCCCCATTTACCCA
ATTGTAGATATGCTAACTCCAGCAATGAGTTGATGAATCTCGGTGTGTATTTTATGTCCT
CAGAGGACAATACCTGTTGTAATCGTTCCTCCACACGGATCCCAATTGCCCCTATAGTGA
GTCGTATTACAATCACTGGCCGTCGTTTTACAACGTCGTGACTGGGAAAACCTGGCGT
TACCCAACTTAATCGCCTTGACGACATCCCCCTTCGCCAGCTGGCGTAATAGCGAAGA
GGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGACGCGCCC
TGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTT
GCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCCTCCCTTCTCGCCACGTTTCGCC
GGCTTTCGCCGTCAAGCTCTAAATCGGGGGCTCCCTTAGGGTTCCGATTTAGTGCTTTA
CGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCC
TGATAGACGGTTTTTCGCCCTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCTTG
TTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATT
TTGCCGATTTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAAT
TTTAACAAAAATATTAACGTTTACAATTTCTGATGCGGTATTTTCTCCTTACGCATCTGT
GCGGTATTTACACCGCAGGCAAGTGCACAAACAATACTTAAATAAAATACTACTCAGTAA
TAACCTATTTCTTAGCATTTTTGACGAAATTTGCTATTTTGTAGAGTCTTTTACACCAT
TTGTCTCCACACCTCCGCTTACATCAACACCAATAACGCCATTTAATCTAAGCGCATCAC
CAACATTTTCTGGCGTCAGTCCACCAGCTAACATAAAATGTAAGCTTTCGGGGCTCTCTT
GCCTTCCAACCCAGTCAGAAATCGAGTTCCAATCCAAAAGTTCACCTGTCCACCTGCTT
CTGAATCAAACAAGGGAATAAACGAATGAGGTTTCTGTGAAGCTGCACTGAGTAGTATGT
TGCAGTCTTTTGGAATACGAGTCTTTTAATAACTGGCAAACCGAGGAACTCTTGGTATT
CTTGCCACGACTCATCTCCATGCAGTTGGACGATATCAATGCCGTAATCATTGACCAGAG
CCAAAACATCCTCCTTAGGTTGATTACGAAACACGCCAACCAAGTATTTTCGGAGTGCCTG
AACTATTTTTATATGCTTTTACAAGACTTGAAATTTTCTTGCAATAACCGGGTCAATTG
TTCTCTTTCTATTGGGCACACATATAATACCCAGCAAGTCAGCATCGGAATCTAGAGCAC
ATTCTGCGGCCTCTGTGCTCTGCAAGCCGAAACTTTCACCAATGGACCAGAACTACCTG
TGAAATTAATAACAGACATACTCCAAGCTGCCTTTGTGTGCTTAATCACGTATACTCACG
TGCTCAATAGTCACCAATGCCCTCCCTCTTGGCCCTCTCCTTTTCTTTTTTCGACCGAAT
TAATTCTTAATCGGCAAAAAAAGAAAAGCTCCGGATCAAGATTGTACGTAAGGTGACAAG
CTATTTTTCAATAAAGAATATCTTCCACTACTGCCATCTGGCGTCATAACTGCAAAGTAC
ACATATATTACGATGCTGTCTATTAATGCTTCCTATATTATATATATAGTAATGTCGTT
TATGGTGA CTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACC
CGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGAC
AAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTACCGTCATCACCGAAAC
GCGCGA

FIG.99D